Rubber Journal and International Plastics

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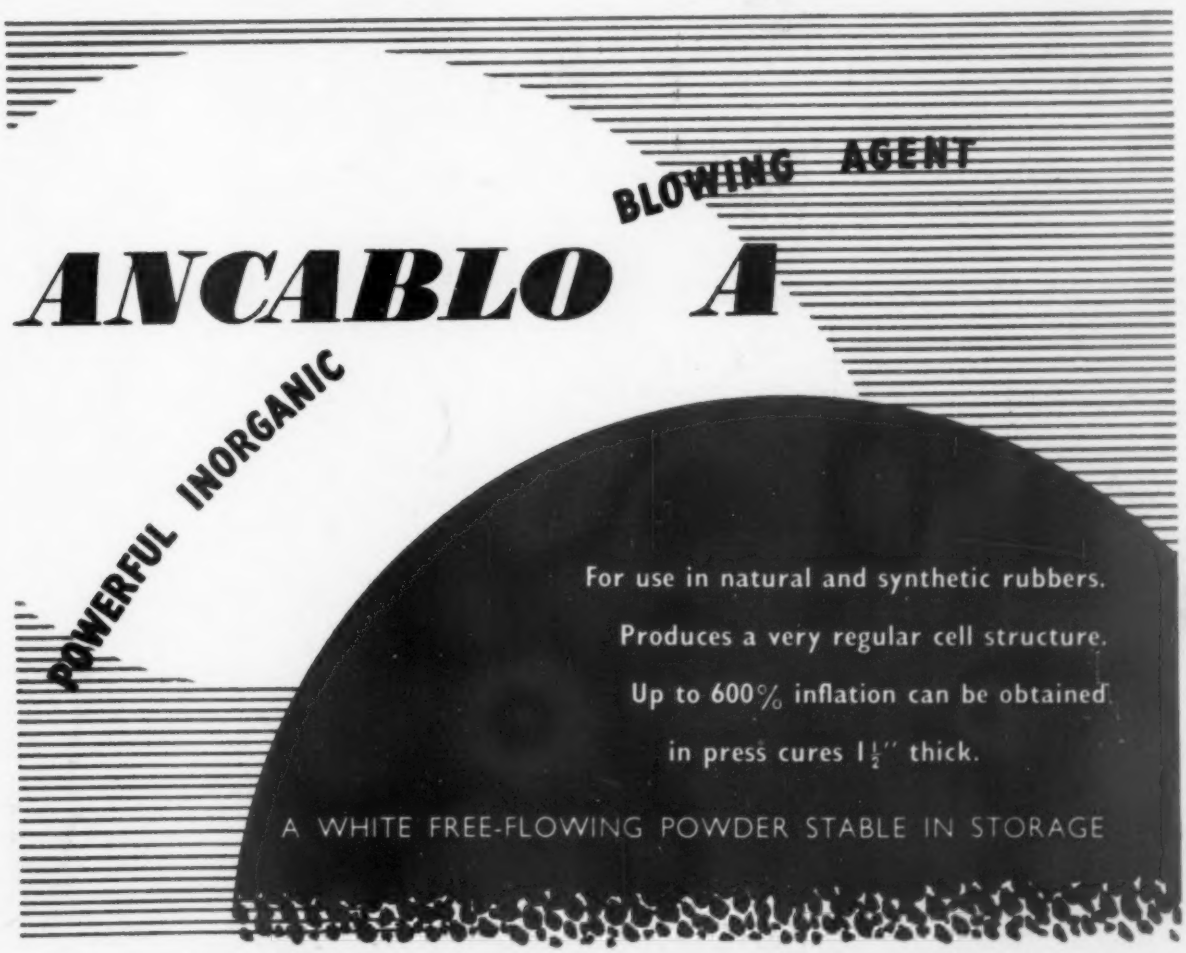
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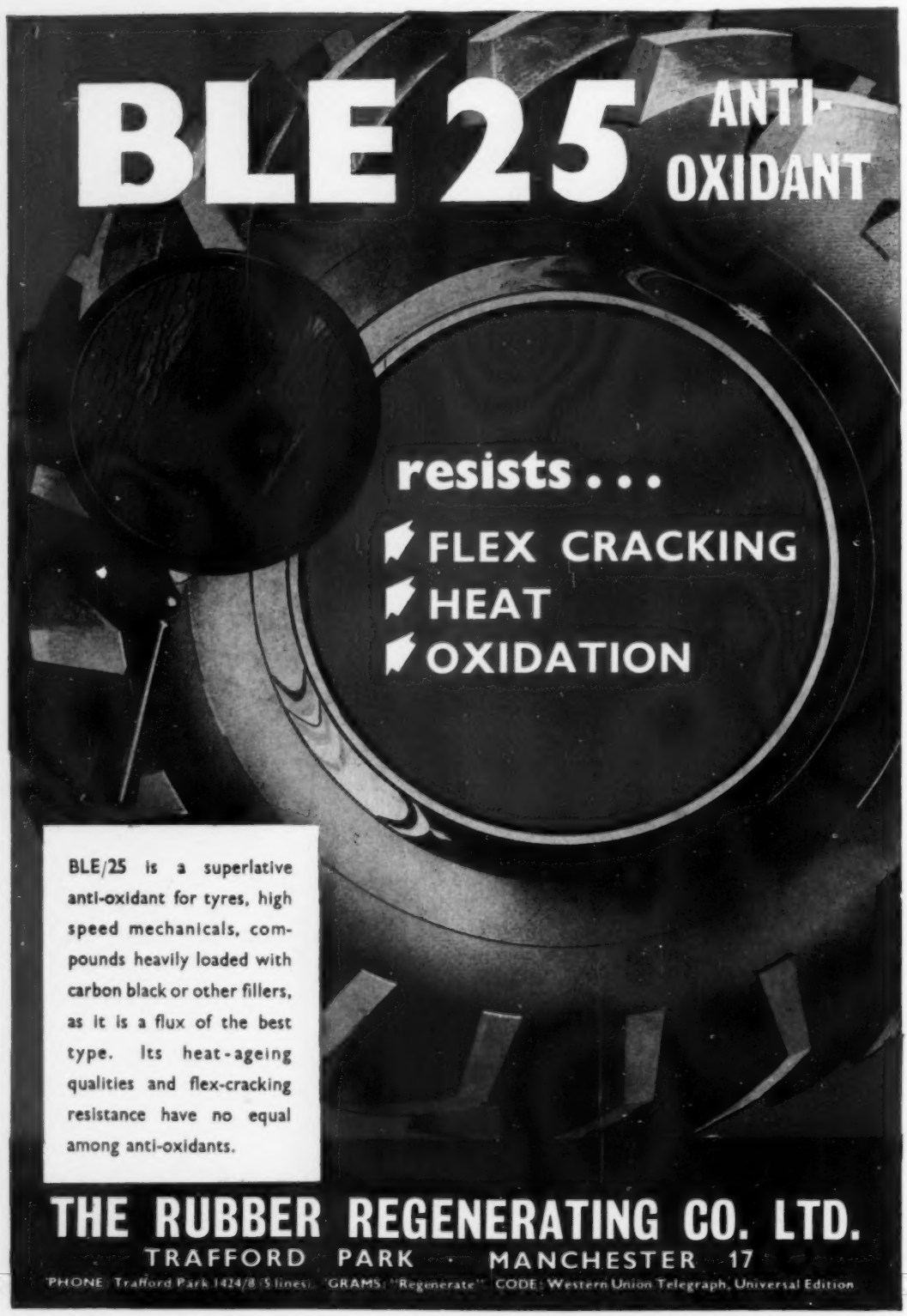
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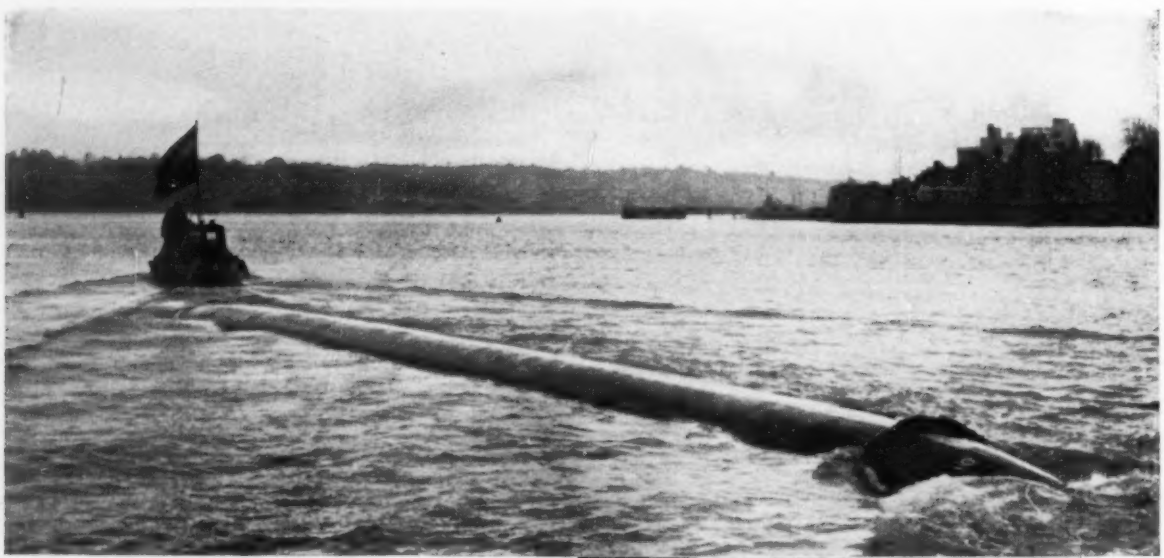

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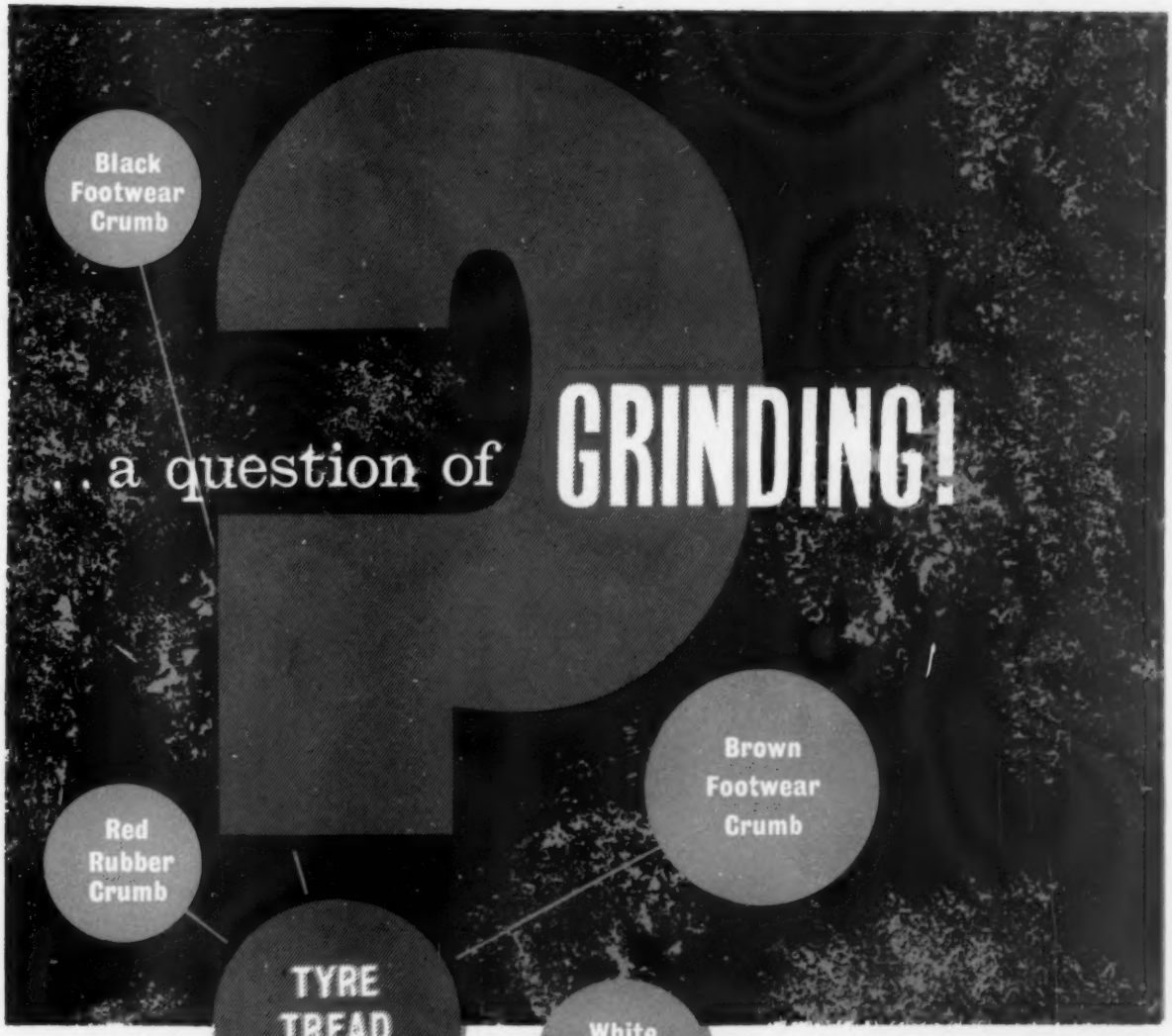

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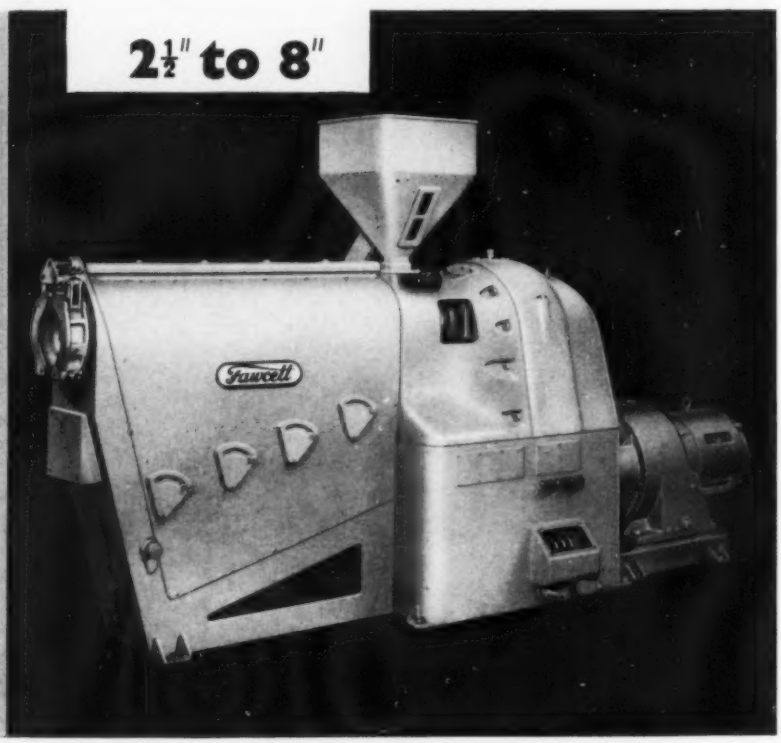

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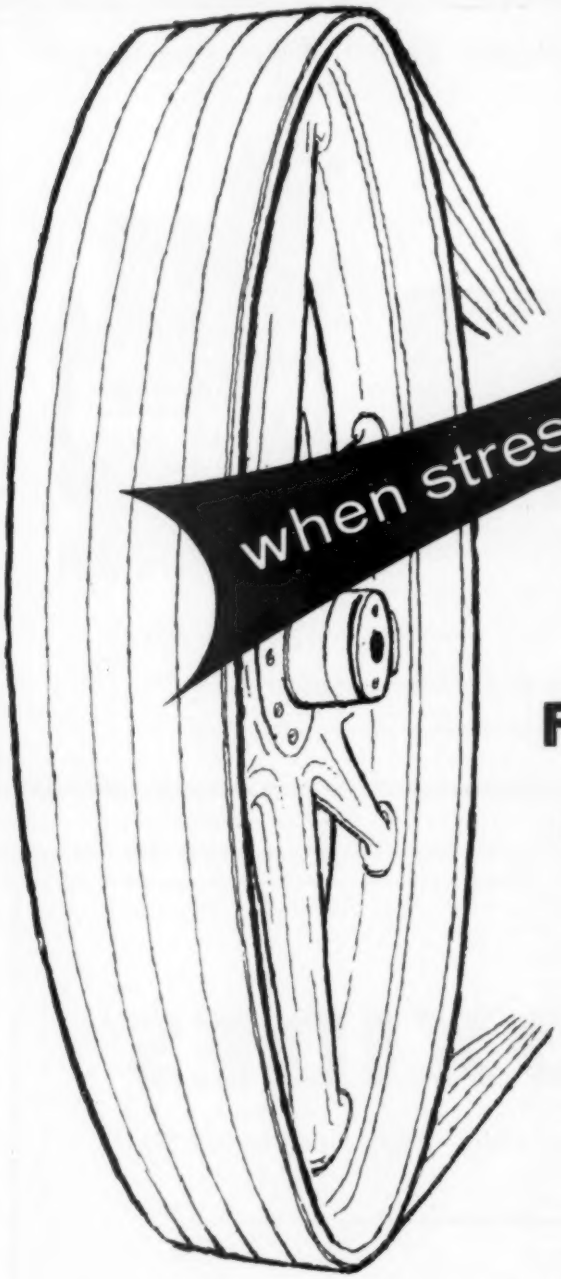

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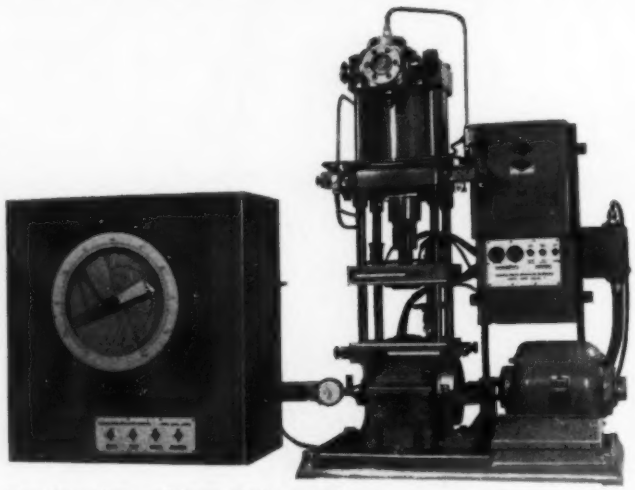

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Rubber Journal and International Plastics

Volume 138 **Price 1s. Post free 1s. 4d.** **No. 12**

IN ITS 76th YEAR

March 19 1960

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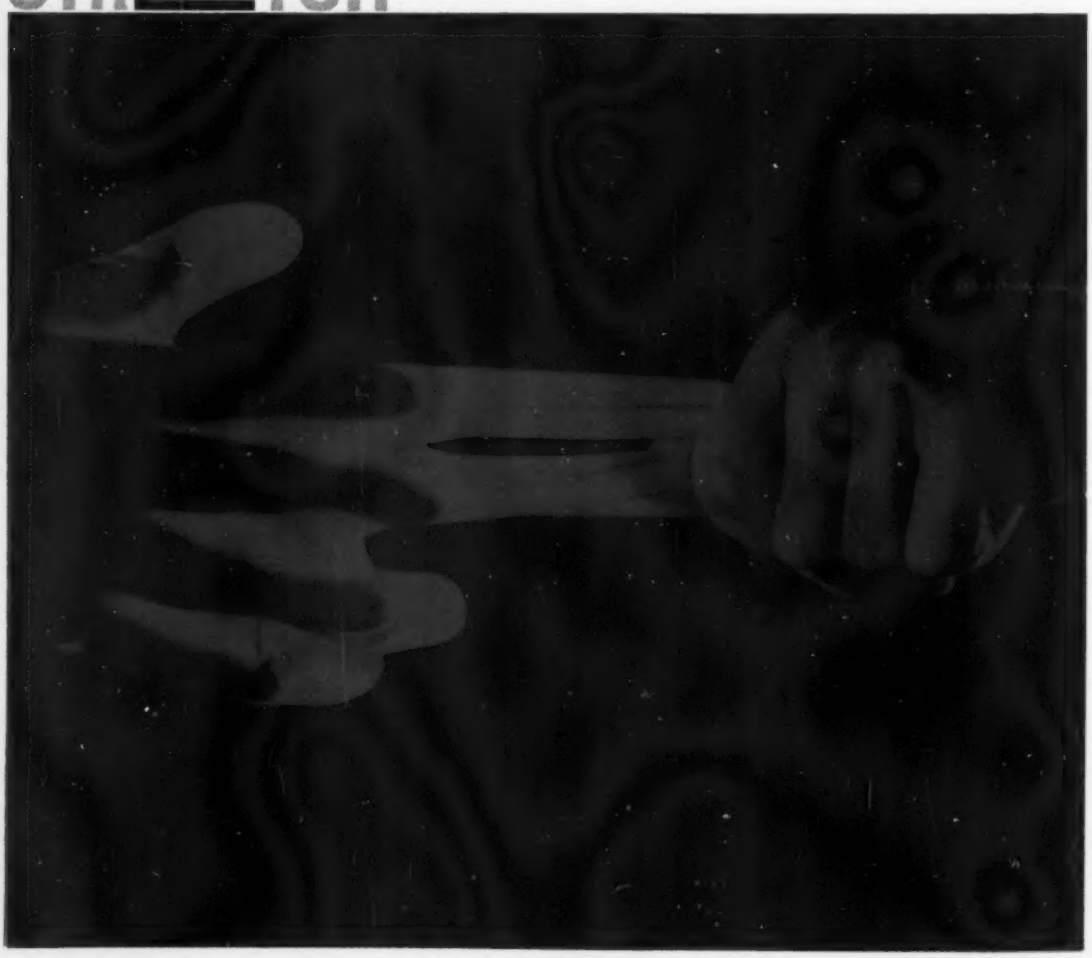


NOTES of the WEEK

Rubber Research Plans

FAR-REACHING plans for bringing control of natural rubber research and development under the direction of the Malayan Rubber Fund Board, and ultimately under that of the Malayan Government, have been announced by Sir Godfrey Clay, the Controller of Research. The new structure of the natural rubber research bodies (reported elsewhere in this issue) has the Malayan Rubber Fund Board in Kuala Lumpur at the top. This board will have direct control over the Rubber Research Institute in Malaya. In London it will deal through two organizations, shortly to be formed, both of which will be responsible to Kuala Lumpur. These are to be the Natural Rubber Producers' Research and Development Association and the Coordinating Advisory Committee. Virtually merged into the first of these bodies will be the boards of management of the British Rubber Producers' Research Association, the Natural Rubber Development Board and Rubber Technical Developments Ltd. Sir Geoffrey Clay will be chairman and Mr E. Jago, deputy chairman of the NRDB, will be vice-chairman. Sir Geoffrey is also to be chairman of the second body which will advise on research and staff selection.

The plan marks an important change in policy, the effect of which should be to bring the various organizations concerned into much closer contact with each other; to ensure a greater degree of co-operation and to simplify administration. Sir Geoffrey Clay, who was appointed Controller in November 1958 (*RJIP*, November 8 1958) and took up the position last year, has certainly got down to his by no means simple task in no uncertain manner. The natural rubber industry should reap considerable benefit from the new policy.

Advance Statistics

AN innovation of considerable value and interest has been made by the Federation of British Rubber and Allied Manufacturers. Included in the urrent issue of the Federation's weekly Export Information Sheet are duplicated statistics—issued in other words in advance of their printed statistics—of export figures for trade with countries of the EEC (Common Market) and the EFTA. The Federation propose to publish this advance information quarterly as a supplement to the Sheet. The first figures issued under this scheme are for exports for 1959 (import figures are to follow). Comparative figures for 1957 and 1958 are also given, not only in total but for each one of the countries concerned. From these it can be seen that exports of the rubber industry (excluding tyres) to EEC countries have, in total, increased steadily from £2,491,205 in 1957 to £2,566,044 in 1958 and to £2,779,293 in 1959. Totals, again excluding tyres, to EFTA countries for the three years were as follows: £1,858,706, £1,962,921 and £1,880,238, which shows that exports were, in fact, down for 1959 as compared to the previous year.

The trends under the separate headings are of interest. Among those manufacturers whose export figures (comparing 1957 and 1959) showed increases to EEC countries and decreases to EFTA countries were the following: rubberized and proofed fabrics, footwear, rubber hose, rubber flooring and belting, which was up nearly £100,000 to EEC countries and remained at almost exactly the same figure to EFTA countries. Among those manufactures the export of which increased to both areas were: medical and surgical, sheets and sheeting and 'other rubber products' (from gloves to adhesives) which latter showed an increase of nearly £200,000 to EEC and about £60,000 to EFTA countries. On the other hand, cellular rubber products showed a small increase to EFTA and a decrease to EEC countries. It seems likely that publication of advanced information of this nature will prove valuable to Federation members.

Changes

CHANGES of name and changes of address and telephone numbers are among those necessary bits of information that tend, all too frequently to be mislaid or ignored or on which action is, with the best of intentions, postponed. Normally all that is sent, or received, is a small card. It was all the more refreshing, therefore, to receive the other day not a small card but a reasonably-sized sheet and not merely one example but five. These were further headed 'Internal Memorandum' and bore the words 'To' and 'Department' with blank spaces opposite. This admirable method was adopted by Durable Plastics Ltd. to notify their change of name to Plastic Coatings Ltd. By this means, all departments of a large organization can make adjustments to their records with the minimum of delay and trouble. It has sometimes been our sad experience, when one small card has been received, to discover that it has taken a great deal of time to move from department to department. On the way, it has gradually accumulated more and more tea stains and hastily scribbled phone messages until it is barely decipherable. So, other firms please copy.

NEWS *Briefs*

CANADIAN FILM PLANT—HUNGARIAN EXPANSION
BRAZIL CONSUMPTION UP—FABLON IN HOLLAND
ARGENTINE SBR INVESTMENT—MONSANTO PVC

●**United Kingdom** — The Board of Trade is considering an application to remove import duty on 'co-polymers solely of acrylonitrile with 5-vinyl-picoline and containing not less than 40 and not more than 60% of acrylonitrile.'

●**Canada**—Asbestos Corporation Ltd. reports net income of $3,057,379 or $1.69 a share for the year ending December 31. This compares with $4,134,769 or $2.29 a share in 1958. In spite of intensified competition sales increased 3% in value.

●**United States**—The Firestone Tire and Rubber Company, Akron, reported record sales for the first fiscal quarter ended January 31, but earnings declined slightly as a result of increased costs and lower replacement tyre prices during the period. Net income for the three months was $13,564,023, compared with $14,350,000 in the corresponding period last year. Sales were $273,921,522 against $272,471,860.

●**Argentina**—The Argentine Government has approved investment of US$60m. by Fish International Co., in a petro-chemical plant to produce synthetic rubber and other materials. It is reported that this plant, together with another operated by the Texas Butadiene Co., will enable Argentina to become self-sufficient in rubber production.

●**South Africa**—An official of Kellog International said that Sasol (South Africa's big oil-from-coal project) may also turn its attention to the production of polythene. The country imports about £3m. a year.

●**Hungary**—New machines will be installed in the Budapest Rubber Goods Factory, as part of this year's 90m. forint (about £2.7m.) investment. Under the second five-year plan (1961-1965) 410m. forints more is to be spent on the complete reconstruction of the works. By 1966 output is expected to be doubled without an increase in staff, a company official stated.

●**United Kingdom**—British Insulated Callender's Cables has received an order from Lisbon Electric Tramways for the supply and installation of 9,750 yards of 33kV 3-core pressure cable and 9km. of twin telephone cable and accessories.

●**Canada** — Expansion of Monsanto Canada Ltd.'s polyvinylchloride production facilities, Opalon vinyl resins and compounds, is announced by the company's president, Leo E. Ryan. The expansion programme will result in an increase in production of PVC of about 40% at the company's Ville La Salle plant and will be completed within one year.

●**United Kingdom**—Key Glassworks has decided to enter the plastics market and the necessary preliminaries are under way. Recently the group announced that its net profit had expanded from £146,617 to £286,656; and the dividend was raised from 15% to 23¼%.

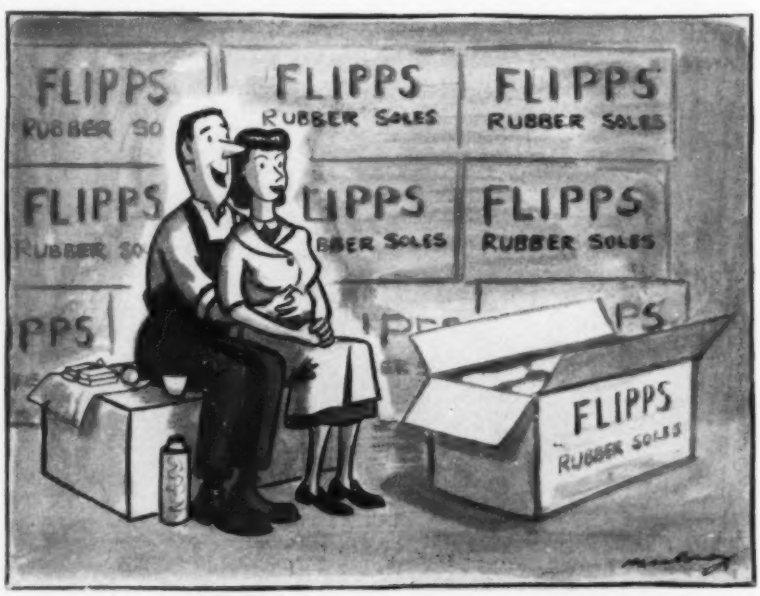
●**Canada**—Work will start shortly on a polythene film plant to be built at Brampton, Ontario, by Peel Ltd. and Mastex Industries, a subsidiary of Canadian Industries Ltd. Production is expected to begin late this year of the film and of products. This will mean, it is reported, that Canadian Industries will become the first fully integrated producer of polythene film products in Canada.

●**United Kingdom** — Unilever is entering the soft drinks market with Spree, a fruit squash sold in sealed sachets made of a polythene and Cellophane mixture. Each sachet contains enough concentrated juice for one glass of squash.

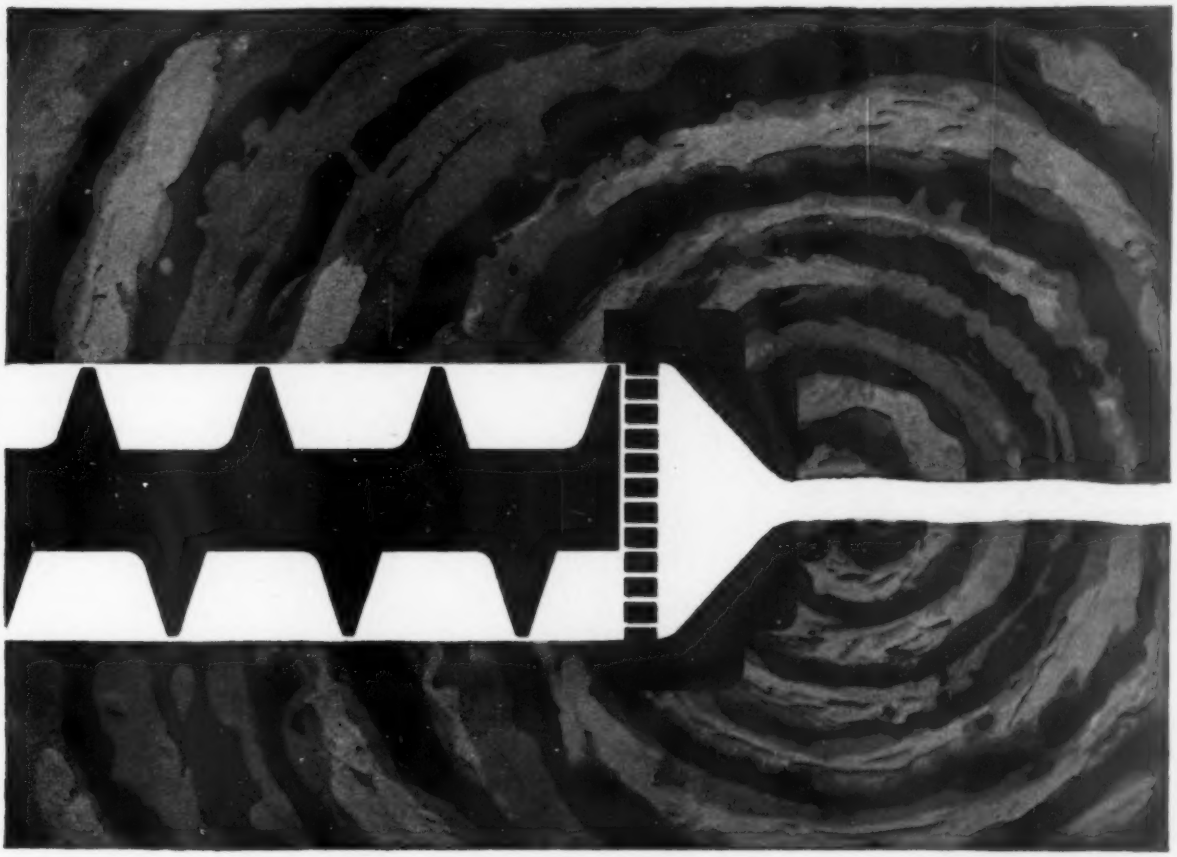
●**Netherlands** — Commercial Plastics Ltd. and N. V. Boekelosche Stoombleekerij, Boekelo, a textile firm in Holland, have formed a joint company called Boekelo Plastics N.V. The new company will make Fablon and Boeklon Self-Adhesive Film, PVC/textile laminates and other plastic materials and products.

●**Brazil**—The establishment of the motor vehicles industry in particular and Brazil's industrial growth in general, have caused a sharp increase in rubber consumption, which rose from 36,000 tons in 1956 to an estimated 53,600 tons in 1959, according to a Bank of London and South America report.

●**United Kingdom** — An order for 22m. plastic water bags, worth £165,000, has been placed by the East Midlands Division of the National Coal Board with Commercial plastics, of Wallsend, and Albert Green (Plastics) of Derby.



'And then someday, maybe, the almost imperceptible "pfft, pfft, pfft" of little feet'—476



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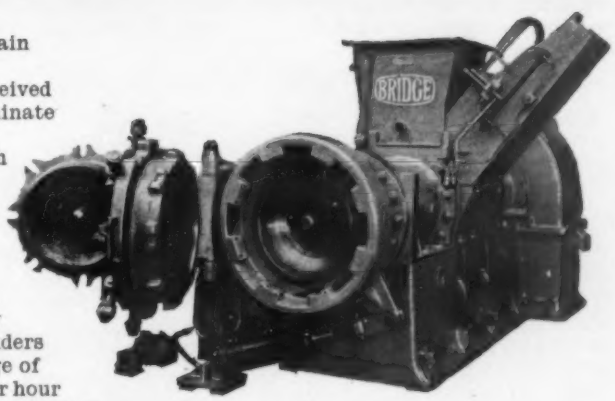

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Polyamide and Rubber Materials*

THE combination of rubbers and plastics is a very promising line for development of new types of materials. The plastic can play the part of the load-bearing base replacing the fabrics usually employed for these tasks. Apart from the economic advantages arising from this change-over, we can exploit the more valuable properties of the original polymers to produce articles with a high standard of serviceability. Thus we can produce light, impervious materials, characterized by high resistance to ageing, corrosive media and solvents, enhanced moisture resistance and with required dielectric characteristics.

The Choice of Plastics for Study

Of the polymeric plastics, polyamide combination with rubbers appeared promising. Polyamide plastics have acquired wide industrial use as a result of their characteristic high strength, chemical stability and good resistance to abrasion and mechanical deformation. As a standard polyamide, the caprolactam polymer known industrially as PK-4 was selected. The properties of a test specimen are given in Table 1.

TABLE 1
PRINCIPAL PROPERTIES OF PK POLYAMIDE FILM

Thickness (mm.)	Weight (g./sq.m.)	Strength of a strip of width 50 mm. in kg. Transverse	Strength of a strip of width 50 mm. in kg. Longitudinal	Tensile strength (kg./sq.cm.) Transverse	Tensile strength (kg./sq.cm.) Longitudinal	Elongation (%) Transverse	Elongation (%) Longitudinal
0.07	60–70	45–55	15–20	1,600–1,200	400–500	50–150	300–400

PK-4 polyamide film is characterized by considerable anistropy of the strength and deformation properties. Accordingly the isotherms of deformation of the films under investigation differ essentially in the longitudinal and transverse directions. (Fig. 1.)

On stretching the film in the longitudinal direction we may note three deformation ranges: on stretching up to 25% the deformation increases proportionally to the load, after which there comes a phase of flow in which small increases in load are accompanied by big deformations; further deformation again involves increase in the load required. Such a curve is determined by the presence of three types of deformation: (1) the true-elastic, (2) the high-elastic, connected with alteration in the shape of the chain molecules, and (3) irreversible viscous flow deformation, connected with regrouping of the chain molecules as a whole. In the transverse direction such 'flow' is absent and we observe the well-known proportionality between load and deformation. The work of Soviet investigations[1,2,3] on the structure of polyamides makes it possible to explain the mechanism of deformation of these polymers, and also the character of the alterations they undergo under various influences.

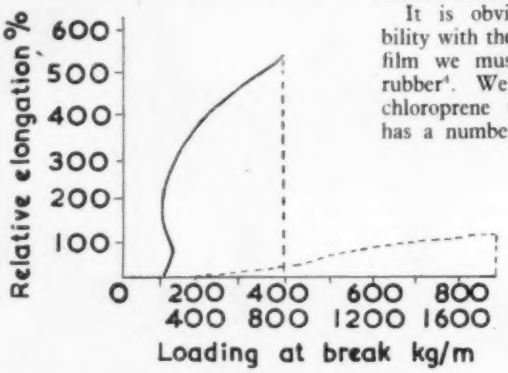

Fig. 1. Isotherms of deformation of polyamide film

Along with their good features polyamide films have a number of important shortcomings, in particular poor ageing resistance. Under heat ageing part of the plasticizer, a lactam, is lost, as a result of which considerable shrinkage takes place and the internal friction during deformation is increased. The joint action of light and heat causes more profound changes of a destructive nature connected with the scission of valency bonds; we observe a falling-off in strength, the specimens of film becoming brittle and breaking under a very small load. The biggest change in ageing is in the properties of the film in the longitudinal direction, where the strength is determined by the weaker forces of intermolecular attraction. We must also note the poor cold resistance and hydrophilic nature of PK-4 polyamide films. These drawbacks may be considerably reduced or removed by the application of coatings based on synthetic rubbers.

It is obvious that for compatibility with the highly-polar polyamide film we must select a highly-polar rubber[4]. We therefore selected polychloroprene which, of course, also has a number of valuable associated properties in service. One very important property of polychloroprene rubber is that of achieving adequate adhesion and strength of the film at low temperatures of vulcanization, since the polyamide film does not stand up to normal temperatures of vulcanization.

Construction and Mix Formulation for the Materials

According to the service requirements, structural materials of rubber and plastics may be made up of one, two or more layers. The polychloroprene coating is applied in the form of a self-vulcanizing compound of the following composition (in parts by weight):

Polychloroprene	100
Magnesium oxide	10
Colophony	5
Neozone D (=PBN)	2
Altax (=MBTS)	1
Zinc oxide	1

In view of the light and heat protective and light absorbent properties of carbon-containing fillers[5], it is highly advantageous to add carbon black and graphite to protective coatings of rubber.

We established the optimum weight of rubber composition for the most effective protection of a unit of surface of film at 40g./sq.cm. In the irradiation by quartz mercury lamp of specimens of material with different weights of covering (from 20 to 60g./sq.m.) we observed stiffening and stripping mainly on specimens with 20g./sq.m. coats.

* *By L. M. Pesin, M. G. Maizel's, K. N. Vlasova, M. L. Dobrokhotova and G. V. Ternovskaya (Plasticheskie Massy, 1959, No. 2, 25-29). From translation No. 792 by the Research Association of British Rubber Manufacturers—translator R. J. Moseley. The text has been edited considerably to bring it more into style with Western usage. Details of manufacturing technology in the original RABRM translation have been omitted.*

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Materials based on rubbers and plastics may be widely used for industrial purposes, in particular for industrial and mining ventilation ducts. As expected at high rates of movement of the gases or with a considerable dust content we get the setting up of undesirable electrostatic charges on the internal surfaces of the duct. This is particularly the case when using materials based on polyamide film, with its good dielectric properties (surface resistivity = 10^{13} to 10^{14}ohms.). As a result it becomes necessary to give the material electrically conductive properties, and this is achieved by using coverings of graphite-loaded rubber, which with a weight of coating of 25 to 30g./sq.m. reduces the surface resistivity from 3.8 x 10^{13}ohms. to 4.7 x 10^{3}ohms. In practice, it is sufficient to apply a covering of weight 12 to 15g./sq.m., which reduces resistivity to 10^{5} to 10^{6}ohms. The covering contains rubber and graphite in ratios 1:1.5 to 1:2.

According to the data collected, the following structure of a single layer material appears desirable: (1) a protective rubber covering of 40 ± 5g./sq.m.; (2) a polyamide film 60 to 70g./sq.m.; (3) a graphite protective covering 30 ± 5g./sq.m.

In two-layer and multilayer structures we employed plying-up of the layers of polyamide film in sequence. It was found that cements of non-polar rubbers (polyisoprene, polybutadiene, polyisobutylene and Butyl rubber) gave significantly inferior results to those with polychloroprene: the specimens tested underwent ply separation at loads so small that they were not recorded by our apparatus. But even in the case of polychloroprene rubber the maximum bond strength of the plied-up films did not exceed 0.2kg./cm. One effective means of enhancing the adhesion of polychloroprene to polyamide film is to raise the polarity of the rubber coverings by adding high-polarity synthetic resins to them, or to reduce the polarity of the polyamide film by applying epoxide resins to its surface.

The most significant enhancement of the adhesion of the rubber covering was achieved by the addition of a phenolformaldehyde resin based on *tert.* butyl phenol to the cement. In Fig. 2 we show the influence of the amount of resin in the rubber covering upon the bond strength of the plied-up layers. The adhesion strength increases on increasing the resin content. The optimum amount of resin is 100% on the rubber hydrocarbon, because with further increase in the amount of resin the adhesion strength increases only by an insignificant extent compared with its stiffness.

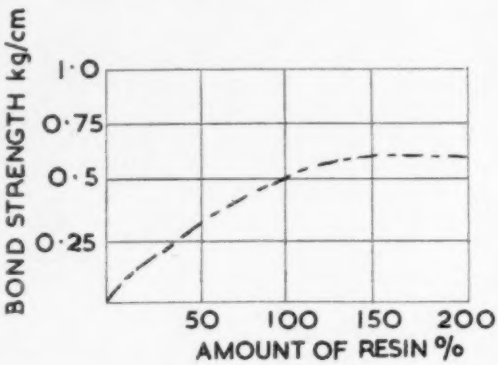


Fig. 2. Influence of amount of butyl phenolformaldehyde resin in the rubber covering upon the bond strength of a rubber plastic system

Synthetic resins (No. 89 epoxide resin and PFE 2/10 methylol polyamide resin) as priming coats under the rubber cement in small amounts (3 to 4g./sq.m.) gave the results of Table 2.

TABLE 2
INFLUENCE OF THE PRIMING COAT OF SYNTHETIC RESINS UPON THE BOND STRENGTH OF POLYAMIDE FILMS WITH RUBBERS

Type of bonding agent	Adhesion strength (kg./cm.) In longitudinal direction	In transverse direction
Polychloroprene cement without priming coat	0.12	0.12
The same, priming coat of PFE 2/10 resin	0.46	0.31
The same, priming coat of No. 89 resin..	0.35	0.50
Polychloroprene cement with 10% resorcinolformaldehyde resin	1.00	1.00

The bond strength of the polyamide films is raised considerably. An increase in the bond strength can be achieved also by adding resorcinol formaldehyde resin to the polychloroprene bonding agent to the extent of 10% on the solids content of the cement. The use of resorcinol formaldehyde resin in the composition of this layer ensures a good bond strength and uniformity of the properties. The minimum amount of polychloroprene cement for plying-up is 10 to 15g./sq.m. to each layer of polyamide film.

It has been found that the best arrangement for a two-layer structure is as follows:

(1) a protective rubber covering, 40 ± 5g./sq.m.;

(2) a polyamide film, 60 to 70g./sq.m.;

(3) a rubber coating for plying-up, 10 to 15g./sq.m.;

(4) a polyamide film 60 to 70g./sq.m.;

(5) a graphite or protective layer, 30 ± 5g./sq.m.

A multi-layer material is built up analogously and differs only in the number of layers of polyamide film.

According to the nature of the stressing in service of the multi-layer materials it will be advisable to employ either parallel or transverse plying-up. This latter eliminates anisotropy of the material to a considerable extent.

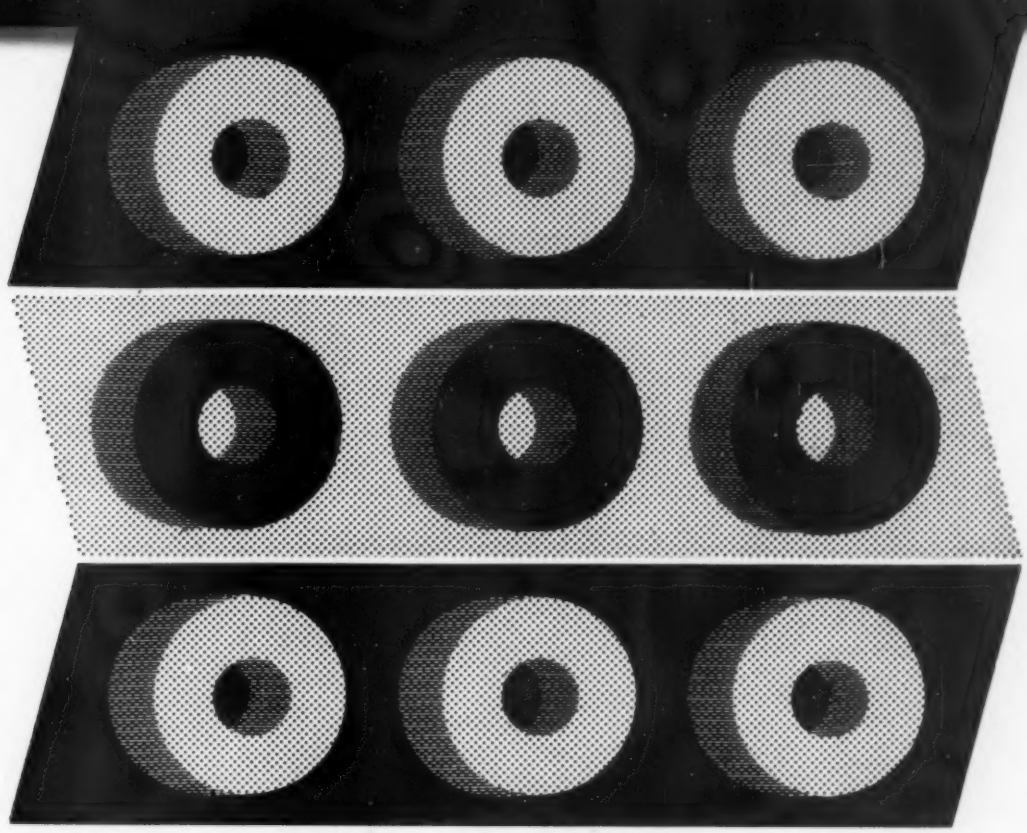
The properties of the original and rubber-coated films are shown in Table 3.

From this table we see that the resulting materials are characterized by high resistance to various media and by low water vapour and air permeability. The combination of rubbers with plastics makes the

Continued on page 442

TABLE 3
PROPERTIES OF MATERIALS PRODUCED BY COMBINATION OF POLYCHLOROPRENE AND POLYAMIDE FILMS

Build-up of material	Weight (g./sq.m.)	Longitudinal Strength (kg./linear metre)	Longitudinal Elongation (%)	Transverse Strength (kg./linear metre)	Transverse Elongation (%)	Vapour permeability (g./sq.m./24 h.)	Air permeability (g./sq.m./(24 h.)	Adhesion strength (kg./cm.)	Cold resistance (°C.)	Accelerated ageing, h. before failure
Original film ..	60–70	400– 500	200–400	1,000–1,200	50–150	60–70	0.1–0.2	—	– 20–30	8
Single-layer ..	160	600– 800	200–400	1,200–1,600	50–150	30–40	0.05	—	– 25–30	40
Two-layer ..	230	1,200–1,600	50–100	1,200–1,600	50–150	12–15	0.01	0.8–1.0	– 35–40	80



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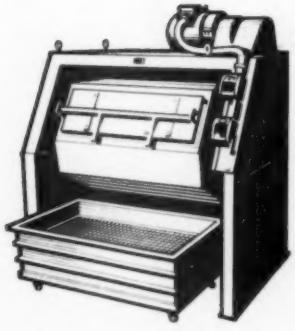

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Thermo Plastics Ltd.

ANOTHER LANDMARK IN EXPANSION PROGRAMME

COMPLETION of a fine new office block at the Dunstable plant of Thermo Plastics Ltd. recently marks still further the growth of the company. Expansion, and rapid expansion, is still very much the order of the day as evidenced by more expansions currently in progress and in the planning stage. New equipment, including a 300oz. injection moulding machine, automatic vacuum forming and other machines, is scheduled for installation this year.

It is noteworthy that Thermo Plastics Ltd. have always concentrated on an engineering approach in the plastics industry. It is, of course, a truism that the use of plastics in engineering as well as other industries is rapidly increasing but, even so, the company has found that many applications are still overlooked. There has therefore been built up a staff of technical experts to advise production engineers on the potential uses of plastics components in their projects. Thus a complete design and advisory service is offered which covers all grades of compression and injection moulding, glass reinforced moulding and sheet forming.

Thermo Plastics Ltd. was founded in 1932 and began with the manufacture, in London, of fascia letters, signs and display items from cellulose acetate, then one of the few sheet plastic materials available. It was early realized that the material was of considerable potential value to industry in general and had applications in a far wider sphere than the one in which it was then being used. Experiments followed, and within a few years the company was producing a range of plastic components for the aircraft industry, whilst still manufacturing the display pieces for which purpose it had been founded. During the last war, Thermo Plastics Ltd. was wholly engaged in the construction of aircraft parts such as cockpit canopies, radomes, air ducts and air chutes.

To extend the scope of its activities the company acquired Plastra Components Ltd. in 1941. Research increased as new materials became available, and processes and techniques for their use were developed, as also was special equipment.

Immediately after the war the necessity for maintaining full production for the aircraft industry no longer existed. The company was now able to turn its attention to the manufacture of plastic domestic articles, catering equipment and sanitary fittings, such as tea trays, cups and saucers, food covers, sink and draining board units and wash basins.

At the same time research began again, from where it had been abandoned in 1939, into the possible industrial uses of the materials now available. By 1948 Thermo Plastics Ltd. had become well known in the field of plastics. The work that had been carried out during the war on radome equipment inevitably led to experimental work being carried out on glass reinforced resin materials as soon as they became available in this country and Thermo Plastics Ltd. was one of the first British firms to produce components from these materials.

Today the company is among the largest fabricators in the country of, for instance, radomes, chemical ducting and various types of sheeting.

The experience gained in the early years of the company's existence not unnaturally led to its re-entrance into the display and advertising field. Some of the largest mouldings in the country for plastic displays and signs were developed by Thermo Plastics Ltd. and the products of these moulds, in the form of outdoor signs and displays, are in use all over the world. The company also produces a sizable proportion of the components required by the refrigeration, motor and catering industries, but an important part of the company's production schedule is still devoted to the aircraft industry.

Thermo Plastics Ltd. moved the major part of its staff and equipment to Dunstable in 1939. This was a fortunate move, for the London premises were bombed in 1940. In 1947 a permanent factory of 25,000 sq. ft. was built at Dunstable and since that date additional buildings have increased the size of the factory by more than 400%.

In October 1957 Thermo Plastics Ltd. joined the Tootal Ltd. group of companies, and in November of the same year, Mendip (Chemical Engineering) Ltd. also joined the Tootal Group becoming closely associated with Thermo Plastics Ltd. Additional premises (200,000 sq. ft. factory space) were made available to the company at St. Helen's, in Lancashire, where a large proportion of the vacuum forming for the refrigeration industry as well as some of the reinforced resin production is now undertaken.

Fabrication of the Esso advertising sign in acrylic material at Thermo Plastics Ltd. Dunstable factory

At Dunstable, Mendip (Chemical Engineering) Ltd. has for a number of years explored different techniques in the production of pipes and pipe fittings using reinforced resins, and has also developed a number of methods of jointing. The intention, with regard to the latter, has been to provide a joint which can be made by an inexperienced operator on site with relatively cheap equipment and in a short time. The company anticipates considerable demand for the piping systems it has now developed.

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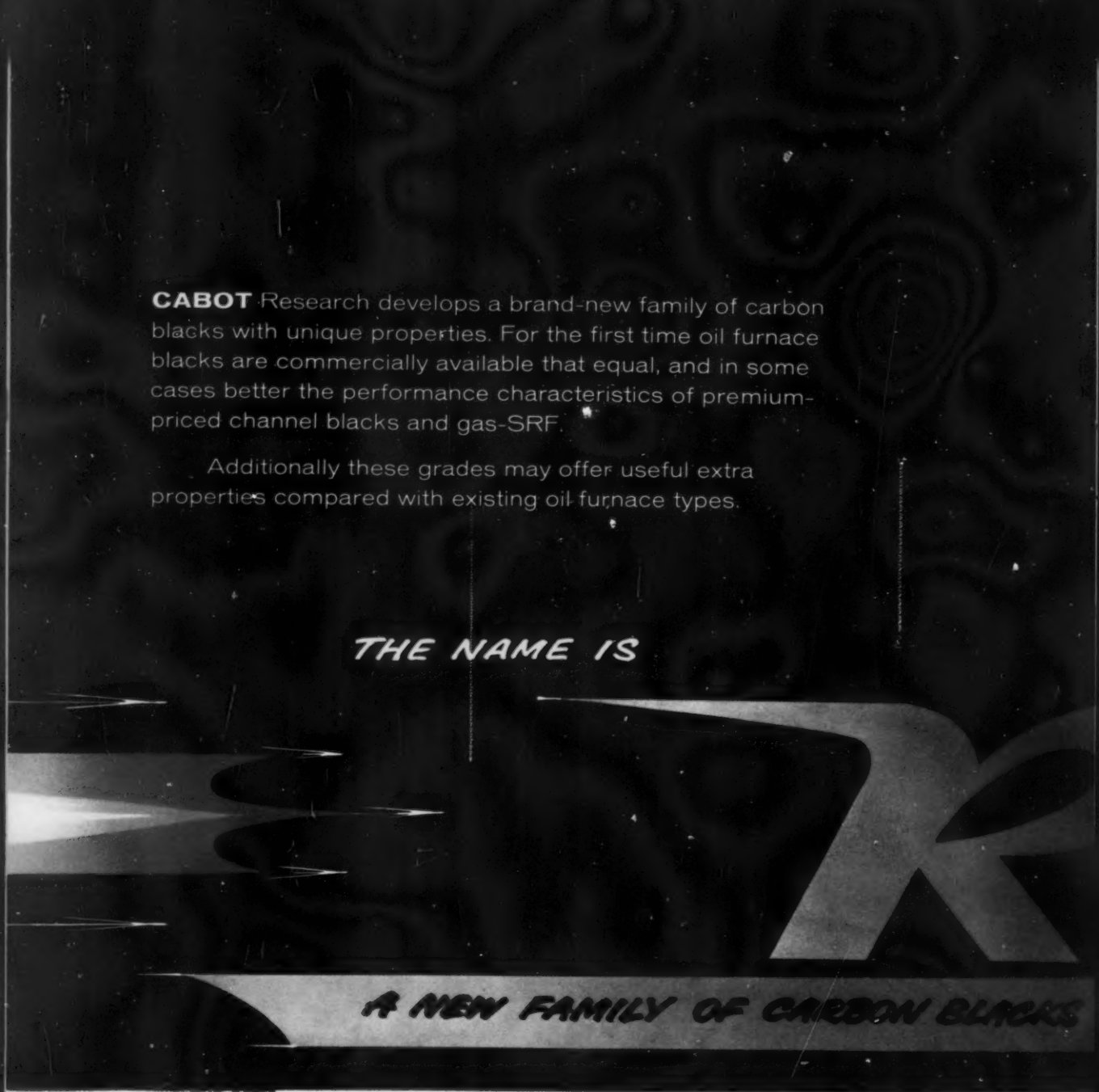
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Natural Rubber Research

CHANGES ANNOUNCED BY SIR GEOFFREY CLAY

From our Correspondent in Malaya

A PLAN for bringing control of natural rubber research and development bodies under the direction of a Kuala Lumpur board (the Malayan Rubber Fund Board) and ultimately of the Malayan Government has been announced in Kuala Lumpur by the Controller of Research, Sir Geoffrey Clay (*RJIP* March 5 1960).

It marks an important change in the organizational structure of research bodies in the natural industry which should bring them closer together working in a single general policy which will be laid down here and will possibly result in some economies. Only technical difficulties seem to stand in the way of the scheme which has of course the support of the Malayan Government and has been agreed to by those concerned in London.

This was one of Sir Geoffrey's most important tasks when he took up the appointment of Controller last year and the scheme has been coming to fruition in a spate of rumours ever since, rumours that were mostly wrong.

Safe and Sure

Sir Geoffrey said here (in Kuala Lumpur), 'It has been realized by everyone concerned, including those in London concerned with the industry, that with independence in Malaya and the passing of the Malayan Rubber Fund Research and Development Ordinance there must be some new organization for the control of certain bodies in London with these developments in the political and legislative fields.

'One of my first jobs was to get it realized in London that control of policy, programming and finance is safe and sure in the hands of the Malayan authorities in the shape of the board and the Malayan Minister of Commerce and Industry.'

Briefly the new structure has the Malayan Rubber Fund Board in Kuala Lumpur at the top. The board contains Government representatives and is also largely representative of the Malayan industry. It administers a fund obtained from a cess of three-quarters of a cent imposed on every pound of rubber exported (it will come to between $11 and $12 millions this year).

The board will have direct control over the Rubber Research Institute in Malaya. In London, where it has a London representative, it is planned that it should deal through two bodies now to be formed—the Natural Rubber Producers' Research and Development Association and the Co-ordinating Advisory Committee, both of which will be responsible to Kuala Lumpur.

The first of these, the Natural Rubber Producers' Research and Development Association, will handle routine matters but not research policy in connection with the British Rubber Producers' Research Association, the Natural Rubber Development Board and Rubber Technical Developments Ltd. It is planned that the boards of management of these three bodies will be virtually merged into the new association, ending any possible lack of co-operation and also simplifying matters.

The Co-ordinating Advisory Committee, which will powerfully represent London opinion, will give advice on the selection of staff and on research.

The important factor is the membership of these two boards which will be agreed on by the Malayan Rubber Fund Board in Kuala Lumpur. The appointments will be made by the Malayan Minister of Commerce and Industry who will consider the advice given by the board. Although it has not been put in so many words, the new organization will ensure that the Malayan industry will hear the piper play the tune they paid for.

A Single Board

Speaking in more detail, Sir Geoffrey said that the board of management of the Rubber Research Institute here would be abolished. Management powers will be in the hands of the Malayan Rubber Fund Board. The director of the institute would be helped by an advisory committee on routine problems but would submit his research programme and expenditure estimates direct to the Malayan Rubber Fund Board.

In London, Sir Geoffrey said that there had up to now been no marked degree of co-operation between the British Rubber Producers' Research Association, the Natural Rubber Development Board in London and Rubber Technical Developments Ltd. There had been allegations that the three boards of management of these bodies had been almost self-perpetuating. The situation was not as bad as that but it was agreed that a change was needed.

Sir Geoffrey said that it was hoped that there would be a single board of management, the new Natural Rubber Producers' Research and Development Association, of which he would be chairman and the vice-chairman the London representative of the Malayan board, Mr E. Jago. This new body would also have two businessmen as members to help with the commercial side. It would not be concerned with research but with administration and finance.

US Committee Member

The directors of the three institutes would be able to refer to the Co-ordinating Advisory Committee for advice on their particular programmes.

The two technical problems concerned with this reorganization which, he indicated, he hoped to overcome, were tax exemption worth £16,000 a year on royalties on some patents and staff superannuation schemes.

Dealing with the Co-ordinating Advisory Committee, Sir Geoffrey said that this body would also have himself as chairman and five British scientists (one of whom would be vice-chairman), two scientists from outside Britain from countries that would not necessarily be members of the Commonwealth, two nominees of the Rubber Producers' Council who would be persons with extensive business experience, a nominee from the Malayan High Commission, a nominee of the Malayan Ministry of Commerce and Industry and two manufacturers' representatives.

Sir Geoffrey said that one of the scientists from outside Britain, it had been suggested, should be Dr Cake, the vice-president in charge of co-ordination and research of the United States Rubber Company, who as corresponding member might keep the committee in touch with synthetic and natural trends and work in the United States.

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He emphasized that if they could fuse the three London bodies they would be able to ensure co-operation. They hoped eventually to have a Malayan as the London representative of the Malayan Rubber Fund Board (at present Mr Jago) but it was essential to have a person of experience in touch with all production and consumption problems.

He indicated generally that in future the Malayan board would, in considering finance, work out a programme of research and then find the finance for it rather than estimate the amount of finance and try to fit a research programme into the estimate. There would be little change in financial allocations this year as there was not time to get the new organization set up. The only major change was in the United States where research on rubber roads was being discontinued in favour of a technical advisory service.

The Controller of Research also made these points:

The Director of the Rubber Research Institute of Malaya, Mr C. E. T. Mann, had retired after 32 years with the institute. There had been about 20 applications for the post and between four and six of these had been outstanding. It was possible a selection committee would hold interviews in London.

The Malayan Rubber Fund Board had decided to 'suspend' consideration of a scheme for a goodwill mission from Malaya to tour other countries, including Russia and Communist China, to boost the sales of natural rubber. (This proposal has been strongly pressed in Malaya by a certain section of the rubber industry but was flatly rejected by the Government which refused to sponsor or finance it, because of the present high price of rubber.)

Bamboo Curtain

A sub-committee of the Malayan Rubber Fund Board had reported in favour of the mission but the full board, said Sir Geoffrey, had decided to suspend consideration of the item. It was 'possible but not probable' that such a mission would be favoured at some later date when the price of rubber was down to a lower level.

'There are political reasons why the Government is not keen on sending a rubber mission behind the bamboo or iron curtains,' he said. 'There are also certain European countries in which we are particularly interested where Malayan rubber is consumed but where there is not terrific competition from synthetic rubber. We want to be sure that we do not neglect any means of increasing the offtake of natural there.'

Instead of the mission, the Malayan Rubber Fund Board had decided to ask a former Malayan Civil Service Officer, Mr P. F. Adams, an expert on rubber economy and statistics, to make a survey of all the countries other than China and Russia from the point of view of consumption and production. For Russia and China, the board had decided to ask 'The Economist Intelligence Unit' to report on synthetic production and the consumption of natural and synthetic by whatever means they considered best.

On a rubber secretariat in Kuala Lumpur, a building which would put all the various bodies and associations in Kuala Lumpur under one roof, Sir Geoffrey said a site had been approved and they intended to go ahead with the scheme. Money spent would be recoverable over 25 years.

Crepe Walking Contest

On a request from the Natural Rubber Development Board for funds with which to go ahead with crepe sole propaganda in co-operation with the Crepe Sole Association of London, Sir Geoffrey said the Malayan Rubber Fund Board has asked for an assurance that the money would be well spent in sponsoring, among other things, a walking contest.

The feeling in Malaya was that with an expanding consumption of natural crepe in countries other than Britain they would prefer to stress this, even at the expense of Britain if necessary.

On an application from the Research Association of British Rubber Manufacturers, they had agreed to increase the annual Malayan contribution from £960 to £2,000. This would just about take care of the decreased value of money since the first contribution was authorized. It had also been agreed to ask the Co-ordinating Advisory Committee when it was set up to advise on financing *ad hoc* projects.

It had been decided not to support a scheme for technical advisory service in India and Pakistan because foreign currency regulations at the moment limited any chance of natural rubber consumption expanding. India produced about 20,000 tons of natural a year in Kerala at the moment and had completed a synthetic plant with a capacity of about 30,000 tons. But a small office would be started in Calcutta which would be visited regularly by Natural Rubber Development Board officials.

Sir Geoffrey spoke of the need in Malaya for a Malayan Rubber Research Advisory Committee on which would be represented scientists from commercial research organizations in Malaya as well as the Rubber Research Institute. The commercial units were more concerned with applied research but there was a case for seeking their advice and opinions.

Along this line of thought, a recent meeting had considered development in Malaya based on the Beaufils theory which when applied in Vietnam was claimed to have given outstanding increases in yield through an analysis of leaves and latex. This was achieved by balancing certain elements in the tree to give precise nutrient replenishment through fertilisers. Plans were now being made for a co-operative effort through the institute's experimental station and on estates.

Commenting generally on the rubber industry, Sir Geoffrey said that discussions he had had in the United States had convinced him that provided world economy continued to expand, it would be impossible for natural rubber production to meet demand in the next five years. It was important in these five years for natural to apply the results of research to reducing the costs of production in anticipation of the time when the price of rubber fell.

In his experience, United States manufacturers were willing to pay a small premium for natural and there were many consumers who still regarded natural as a premium product.

Fibre Machines

Two fibre amalgamating machines in completed form were shown at a recent visit to the new A. E. Callaghan works at Midhurst (*RJIP*, March 12).

By evolving new techniques and incorporating what is claimed to be an entirely new unit—the pre-opener and leveller—the firm has developed fibre amalgamating machines that, in addition to opening the raw material into individual fibres with minimum fibre breakage, also use a closed circuit air current to distribute the fibres on to condenser cylinders in the form of a continuous randomized fibre lap having an even distribution over its entire width and length.

Also shown was the Midhurst opener—designed to meet the growing demand for machinery capable of opening raw, or re-opening waste, materials of various types.

Mr K. M. Cole has been appointed secretary to Leicester Lovell and Co. in succession to Mr H. A. Collinson, who has resigned that position but continues as managing director.

Polymer Degradation

PI AND IRI LONDON JOINT MEETING

DR N. GRASSIE, of the University of Glasgow, lectured on 'Recent Investigations into Polymer Degradation' at the Wellcome Institute, Euston Road, on Tuesday March 1. Few representatives of the IRI were present and, in fact, one feels that these 'Joint Meetings' could be rather better organized as regards the choice of subject matter of equal interest to both groups. The lecture was concerned principally with ester decomposition reactions in the degradation of acrylic polymers. Comparison with model (monomeric) compounds suggests that the normal course of such reactions:

Ester → Acid + Olefin

may sometimes be modified when the ester is bound in a polymer chain. The decomposition of polyvinylacetate is accelerated by the early formation of double bonds on elimination of the early molecules of acetic acid. (Fig. 1.)

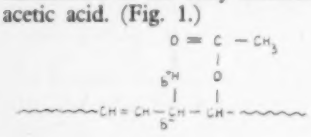


Fig. 1

The electron donating character of the adjacent double bond can then initiate a 'zipper' depolymerization which accelerates along the chain. Evidence was produced for the autocatalytic nature of the reaction and it was shown that plots of (acid produced)$^{\frac{1}{2}}$ v. time were linear.

The degradation of polyvinyl chloride was believed to be by radical mechanisms by analogy with accepted degradation mechanisms for (model) monomeric alkyl chlorides:

Initiation: $Cl—CH_2—CH_2—Cl \rightarrow Cl—CH_2—CH_2\cdot + \cdot Cl$

Propagation: $Cl\cdot + Cl—CH_2—CH_2—Cl \rightarrow HCl + Cl—CH_2—\cdot CH—Cl$

$Cl—CH_2—\cdot CH—Cl \rightarrow CH_2=CH—Cl + \cdot Cl$

Termination: $Cl\cdot + Cl—CH_2—CH_2\cdot \rightarrow HCl + CH_2=CH—Cl$

Model compound studies have shown that—CH_2—groups in PVC are more reactive than—CHCl—groups and, further, that these—CH_2—groups are activated by the double-bonds produced early in the decomposition. This latter effect partially explains kinetic differences observed between PVC and model compounds. (Later, in the discussion, the validity of this radical mechanism was questioned in view of the circumstantial nature of the evidence.)

Returning to acrylic polymers, Dr Grassie compared the thermal depolymerization of polymethyl methacrylate (PMMA) with that of poly-t-butyl methacrylate (PtBMA). Whereas PMMA gives almost 100% yields of monomer under most conditions, PtBMA gives almost quantitative yields of isobutene (by ester decomposition) being the lowest member of the homologous series to do so. It was expected that the kinetics would approximate to those for model compounds (1st order decomposition) but, in fact, the reaction was found to be autocatalytic with an anomalous rate/time relationship of the form shown in Fig. 2.

Peak A was shown to correspond to the production of practically pure monomer but this accounted for only about 1% of the overall reaction products the majority being isobutene (Peak B). It appears that the residues formed in the ester decomposition

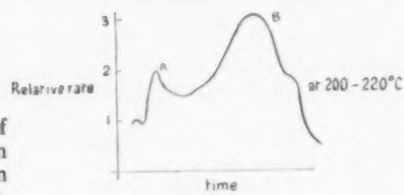


Fig. 2

reaction inhibit the depolymerization reaction and this was shown both by copolymerizing small quantities of methacrylic acid (MA) which reduced monomer yields and by suppressing the ester decomposition reaction (150°C. in presence of UV) when ca 100% monomer yields were obtained. Higher esters gave poorer monomer yields presumably on account of progressively easier ester decomposition reactions.

By preheating copolymers of nBMA/MA containing 1% and 10% MA respectively, it was shown that the MA residues themselves were not causing inhibition of depolymerization but rather their thermal decomposition product.

Infra-red spectral studies of PMA decomposition showed that an anhydride is formed and consideration of structures shows that three possibilities exist. (Figs. 3 and 4.)

Evidence from the frequencies of the twin carbonyl peaks in the IR spectrum suggested the 'Glutaric' structure (I) and this was confirmed by the experimental polymerization of synthesized methacrylic anhydride. However, the insolubility of the PMA pyrolysis product suggests the presence of 'isobytyric' type cross-links (III) which hypothesis is supported by the solubility of the product in ammonium hydroxide which would be expected to hydrolyse the anhydride linkage.

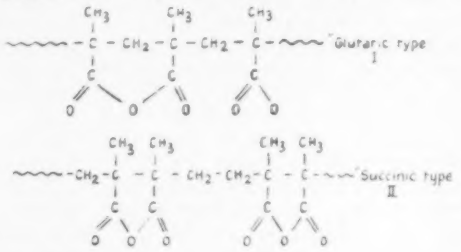


Fig. 3

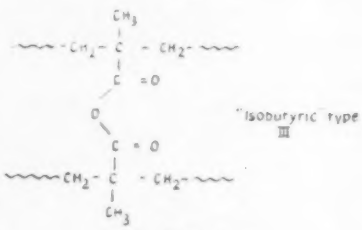


Fig. 4

From this evidence, Dr Grassie suggested a 'double zipper' mechanism for the degradation of PtBMA, the two stages being:

(a) loss of isobutene leaving a methacrylic acid residue in the polymer chain;

(b) an elimination reaction giving anhydride structures which inhibit depolymerization so favouring ester decomposition.

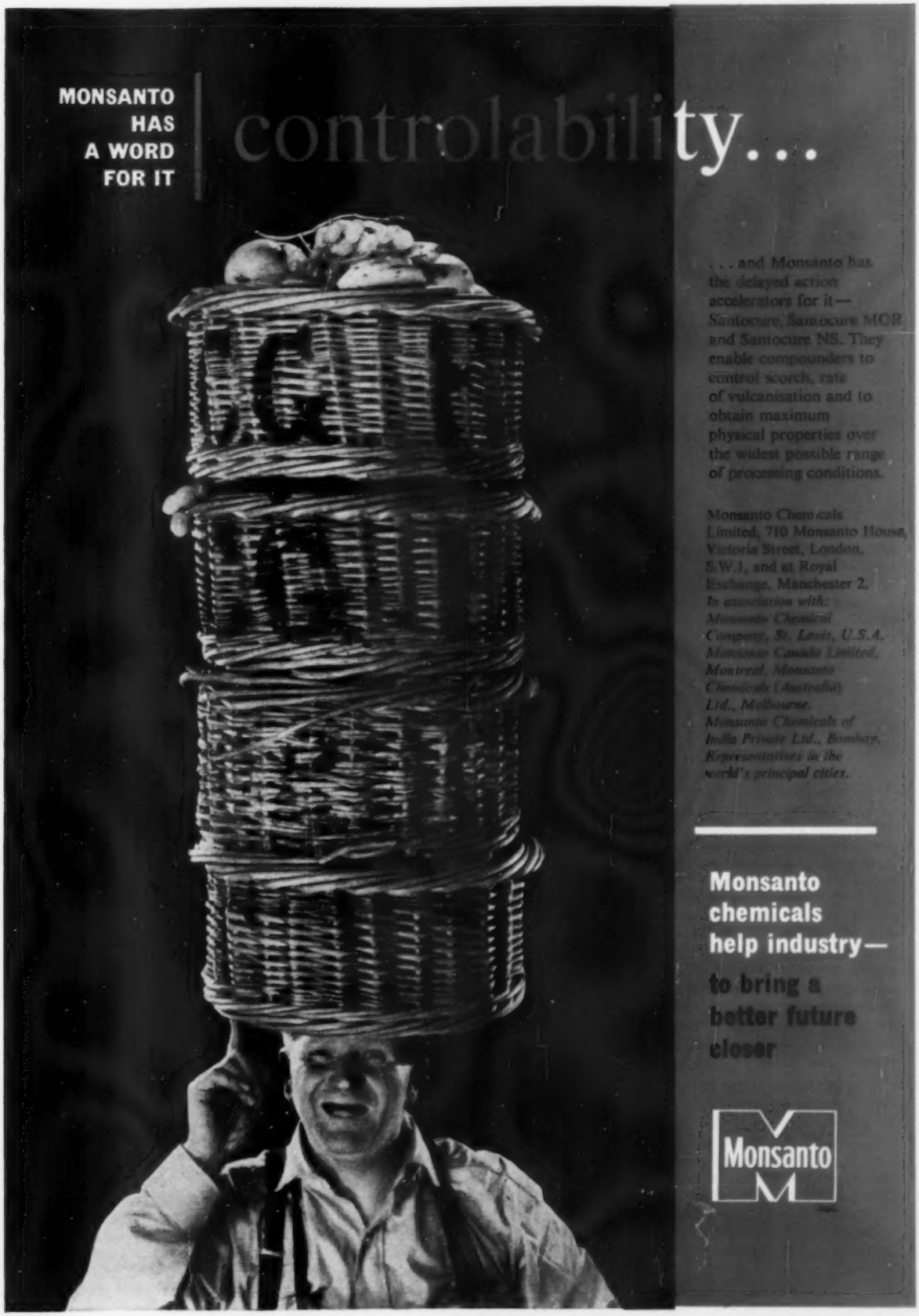
(b) must follow (a) very rapidly at normal temperatures for thermal degradation studies (ca 200°C.).

The lecture was well presented and the subsequent discussion reflected the interest shown by the polymer chemists present, many of whom were visitors to the section meeting.

D. A. S.

New Cubitainer

Iridon Ltd. announce that a new size of 'Cubitainer,' a semi-rigid polythene container with its own specially-tailored corrugated fibreboard outer, is planned, having ½-gallon capacity. The three sizes currently available are 5-gallon, 1-gallon and 1-quart.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BPF Annual Report

ANOTHER YEAR OF EXPANSION

TOTAL membership of the British Plastics Federation at the end of 1959 was 293, says the annual report of the Chairman and Council, which was issued at the annual general meeting this week. This is roughly the same as the previous year, although there have been a number of changes. The biggest increase in membership has been in the Reinforced Plastics Group, whose strength has gone up to 56. The principal reason behind resignations, the report says, 'appears to have been the situation which has developed in the cable industry.'

An early decision is likely now on the proposal to form a joint research association for rubber and plastics, which was first put forward in 1958. According to the BPF report a memorandum to the executive committee recommended a joint organization with the Research Organization of British Rubber Manufacturers, and included proposals for the expansion of existing facilities at Shawbury, and the establishment of a plastics research committee to work under the control of RABRM, and to have representatives on its Council. The report estimates that this would cost £30,000 per annum for the first five years.

Technical Work

The technical work, under the supervision of the main technical committee, covered a very wide range during the year, and two new sub-committees were set up. One is for the preparation of specifications for expanded polystyrene products, and the other deals with 'a code of practice for the fabrication of corrosion resistant PVC and polythene structures.' The former has already looked into a specification for expanded polystyrene board for thermal insulation in two grades: regular and self-extinguishing.

The main committee has submitted three specifications to the British Standards Institution for consideration as draft British standards. They are 'Epoxide Casting Resin Systems for Electrical Applications,' 'PVC Proofed Fabrics for Foul Weather Clothing' and 'Glass Rovings.' A revision of BS 3094 (1959) is being considered (this standard deals with domestic articles made from low density polythene) in view of the wide range of polythene materials that are now on the market.

The Toxicity Sub-Committee has analysed comments on its first report, and a considerably enlarged 'Table of Toxicity' is anticipated for the next edition. Problems of analysis of foodstuffs for the presence of antioxidants which might be extracted from polythene are being tackled by the Analytical Methods Sub-Commitee.

A diagram attached as an appendix to the report shows that, apart from its sub-committees, the main technical committee has fifteen committees springing from it; these in turn give rise to thirteen technical sub-committees. This gives some idea of the thoroughness with which this enormous field is covered.

A major item which one committee carried out with great speed was the preparation, in collaboration with PVC fabricator Members of the Federation, and the British Rainwear Manufacturers Federation, of a revision of B.S. 1774: 1957—Rainwear from Unsupported Polyvinyl Chloride Sheeting. The revision was completed after only three meetings, and includes comprehensive requirements for the sheeting, the strength of which is regulated by the new tear strength test without reference to any minimum thickness, and the requirements for fabrication have been drawn up in such a way as to provide the maximum scope for the fashion designer.

In the fabricator's group, the general extrusion committee's draft standard for unplasticized PVC for cold water services is nearing completion, while the reinforced plastics group, which was formed in March as a group technical committee, has taken over responsibility for the work previously carried out by the glass and asbestos fibre reinforced plastics technical committee of council, and the glass fibres technical committee of the filler section. Projects include methods of test of the ingredients of reinforced plastics and completed laminates, the construction of reinforced plastics lifeboats, an investigation into the long term properties of reinforced plastics, and the technical aspects of glass reinforcements for plastics.

Federation Services

Connexions with other official bodies, both at home and overseas, have been well maintained, the report indicates. Members have served on four committees of the Federation of British Industries, and the BPF has been represented on over 100 British Standards committees throughout the year. The information officer has been kept busy with 11,000 enquiries —44 per working day—while the statistics panel has drafted a new system for the collation of quarterly sales figures, which they hope will eliminate some present errors and ambiguities.

The Federation published a complete revision of the surface coating resin index, and the text of an agreement dealing with mould die sets for injection moulding machines.

The Finance sub-committee has now recommended the new subscription rate that was first mentioned in the 1958 report. The new scale is based on members' turnover, with the addition of a purely nominal sum for membership of each group; it is hoped that it will provide a more equitable distribution of subscriptions from the various interests in the Federation.

New members of the BPF in the period covered by the report were: Artrite Resins Ltd., Addis Ltd., Foley Plastics Manufacturing Co. Ltd., Moulded Plastics (Birmingham) Ltd., Baxenden Chemical Co. Ltd., Cellgrave Co. Ltd., H. G. Fowler and Co. Ltd., Hilma (London) Ltd., Polypenco Ltd., B.I.P. Engineering Ltd., Turner Machinery Ltd., Bristol Aerojet Co. Ltd., Graham Bunn (Wroxham) Ltd., The Daimler Co. Ltd., East Lancashire Plastics Ltd., The English Electric Co. Ltd., Fibreglass Reinforced Plastics Ltd., Glass Fibre Developments Ltd., Martin Goacher Ltd., Laporte Chemicals Ltd., Llewellyn Ryland Ltd., Tersons Ltd., Westpole Motors Ltd.

Microcell Subsidiary

Microcell Ltd. has announced the formation of a new subsidiary company known as Glass Yarns Machinery Ltd. The board comprises Mr Henry Kremer, Mr D. J. Hodgson and Mr D. Crashaw (executive director). This new company is manufacturing specialized plant for the reinforced plastics industry, such as glass fibre preform moulding machines and preform drying ovens.

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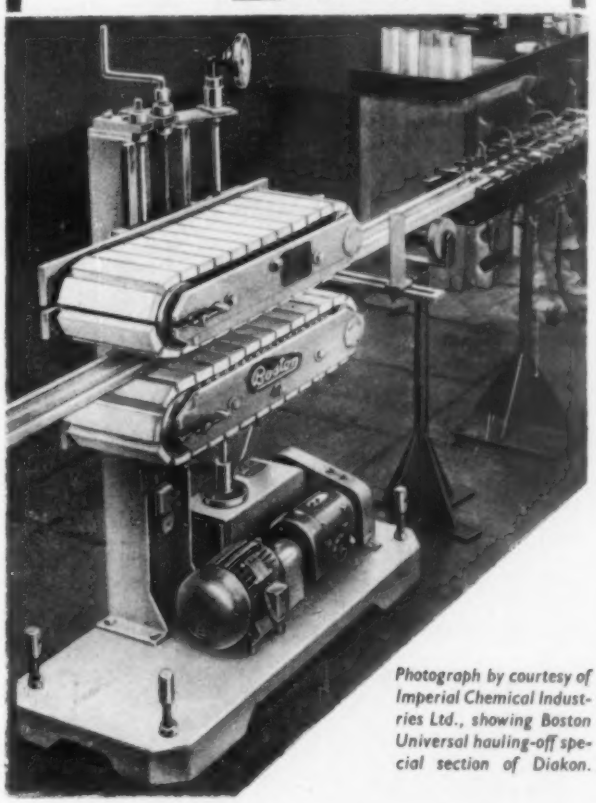

Photograph by courtesy of Imperial Chemical Industries Ltd., showing Boston Universal hauling-off special section of Diakon.

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Plastovac-P

PVC SHEET FOR VACUUM COVERING

STOREYS of Lancaster last week officially announced the production of a special vacuum covering PVC sheeting destined for use in a variety of trades. The technique of vacuum forming has, of course, been in use for some years, but successful vacuum covering, especially with a relatively thin and inexpensive sheeting is a more recent development of the same process.

Plastovac - P is a hard abrasive resistant PVC film which contains only polymeric plasticizers. It has been specially developed for the vacuum covering of a wide variety of articles to obtain a hard-wearing hygienic and decorative finish. It is normally supplied in rolls to nominal dimensions of 100yd. in length and widths up to 49in. Qualities available are: Plastovac 860—8 thou. sheet approx. 7.7oz./sq.yd. Plastovoc 1460—14 thou. sheet approx. 13.3oz/sq.yd., in printed and embossed effects.

The following figures represent average results determined on Plastovac sheeting:

Specific gravity	1.35 approx.
Tensile strength L/T	4,500 lb./sq. in.
Elongation at break L/T	220-250%
Angle tear L/T	550 lb./sq. in.
Emboss retention	Very slight loss of emboss at 175 C., 30 sec.

Chemical Resistance

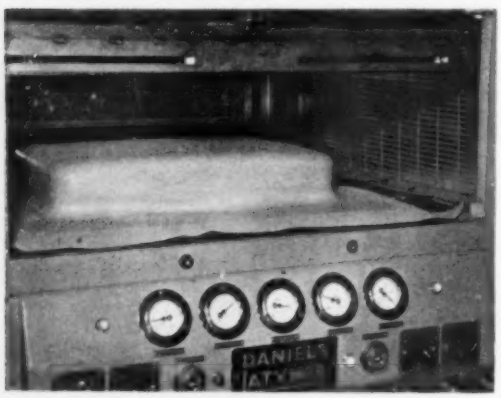
Samples of Plastovac were weighed before and after immersion in various solvents and solutions. The period of immersion was three weeks at room temperature and the samples were allowed to dry out thoroughly before the final weighing. Changes in weight, handle, and appearance are reported in the following table:

Solvent	% Wt. change	cf original
Light oil	+ 1.6	Softer
Fuel oil	+ 0.6	Same
Diesel oil	+ 5.9	Softer
Petrol	– 1.2	Softer
Toluol	– 4.4	Softer
Meths (74 OP)	– 2.7	Same
White spirit	+ 5.0	Same
Carbon tetrachloride	+ 4.7	Same
M.E.K.	Spec.	disintegrated
Hydrochloric acid 10%	+ 0.1	Same
" " conc.	+ 0.1	Same
Sulphuric acid 10%	+ 0.004	Same
" " conc.	+ 21.2	Stiffer
Nitric acid 10%	+ 22.2	Same
" " conc.	– 5.4	Same
Ammonia (880)	+ 1.1	Same
Sodium hydroxide 10%	– 0.7	Same

Resistance to Staining

The following items, after being in contact with Plastovac for one week, either did not stain the Plastovac, or the stains could be removed either by wiping with a damp cloth or by washing with mild soapy water:

Tea, coffee, cocoa, vinegar, mustard, brown sauce, tomato ketchup, chutney, salad cream, jam, marmalade, butter, tomatoes, beetroot, iodine, ink, 'Flit' (fly spray), 'Domestos' (bleach), 'Pin - Up' (home perm.), oil, lipstick. 'Biro' ink could be removed by wiping with a cloth moistened with methylated spirit. The following stained Plastovac permanently: 'Izal,' 'Jeyes Fluid,' shoe dye, shoe polish.



Suitcase lid covered with Plastovac-P 1460 showing plant in raised position

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Dr Adalbert Farkas is the new Assistant Director of Research at Houdry Process Corporation, Philadelphia. Dr Farkas developed triethylenediamine for use as a catalyst with polyurethane foams.

REMEMBER GOODYEAR

An entirely new television campaign was launched by The Goodyear Tyre and Rubber Co. (Gt.B.) Ltd., recently, when the first of a series of TV commercials was screened in the Midlands. The series consists of a 15-second spot appearing at least once every evening during the three months of the campaign.

Theme of the campaign is derived from the common practice of tying a knot in a handkerchief as a reminder. This idea has been adapted in the form of an animal tying itself into a knot to remind motorists to buy Goodyear. Five different 'knot' commercials have been produced for the campaign—animals featured are a giraffe, ostrich, elephant, rabbit and worm. They read: 'Remember! Say Goodyear for longer life and lasting wear.'

US Stockpile Sales

The General Services Administration announced recently that it would continue to sell rubber from the US national stockpile of strategic materials. It said that increased quantities of rubber had been scheduled for rotation but the actual average rate of sales might vary considerably in order to avoid undue disruption of markets.

GSA officials expect the new sales policy might mean sales of between 50,000 and 75,000 tons of rubber each fiscal year. But whether the minimum sales goal of 50,000 tons, or the maximum of 75,000 tons, or possibly more, would be achieved, said the spokesman, would depend on demand.

VIEWS *and* REVIEWS

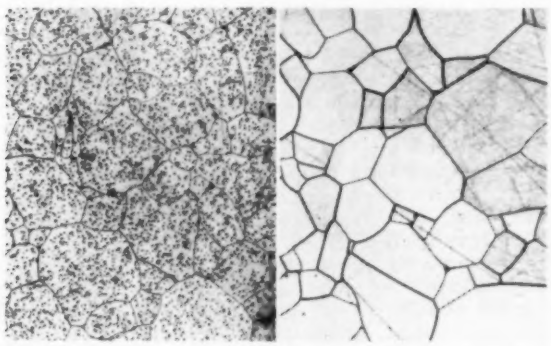
COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **Dr Schidrowitz**

Lucalox

AN interesting new material called 'Lucalox' has been developed by the General Electric Co. (USA). It is described as 'a versatile new material that is almost as transparent as clear glass, resists extreme heat, is remarkably strong, and can be fabricated in any desired shape.' It has been produced by workers at the General Electric Company (USA).

The new material has the composition of a ceramic and the structure of a metal. It is made by pressing fine-grain, high-purity aluminium oxide powder at room temperature, and then firing it at high temperatures. The pressing and sintering process bonds crystals to one another, eliminating the small pores, or bubbles, normally present in ceramics and producing a strong product that resists temperatures up to 3,600°F. and transmits 90% of light in the visible spectrum.



Pores in conventional ceramic (dark spots in photomicrograph, left) scatter the light, making the material opaque. But in Lucalox (right), the pores are eliminated and 90% of light is transmitted. (Dark lines in both photos are grain boundaries. Magnification: 100x)

These properties make Lucalox a material of great potential value in a number of scientific and industrial operations. The temperature of high-intensity incandescent and discharge lamps can be doubled by enclosing them in Lucalox instead of the less heat-resistant fused quartz. Similarly, Lucalox can increase the power of infra red lamps used to test many types of equipment, including missile nose cones and other parts of space vehicles. It shows promise of electrical insulation, as a material for gem bearings in delicate equipment and as an aid in extending the range of instruments and other scientific devices.

NR from Individual Trees

When I receive a letter from my old friend, Dr A. R. Kemp, I always anticipate something of importance. In the present case, the subject of Dr Kemp's letter is possibly not of immediate importance but it has given him an opportunity of explaining certain matters regarding the University of Southern California and TLARGI.

Dr Kemp refers in his letter to my review of his paper —'Constitution and Variability of Rubber from Individual Trees'—in 'Views and Reviews,' October 10 1959, and writes as follows:

'This work was carried out under the auspices and support of the Rubber Technology Foundation of the Los Angeles Rubber Group Incorporated (TLARGI) located at the University of *Southern* California at Los Angeles. (The italics are mine.) This University has no connexion with the University of California as mentioned in your review. Possibly you may wish to publish a note of correction on this point. In this connexion you may be interested in looking over the enclosed brochure of the TLARGI Rubber Foundation. My position as an appointed Research Associate is an honorary one without compensation which enables me to carry out the fundamental research on rubber and polymers in general in excellent chemical and rubber laboratories well suited to this work.'

The brochure sent to me by Dr Kemp describes the progress made by the TLARGI Rubber Technology Foundation and its plans for the future. The list of subscribers to the Foundation includes most of the leading rubber manufacturers in the USA as well as a number of individuals which is excellent evidence of the soundness of the institution.

The activities of the Foundation, as given in the brochure, are as follows: (1) Supports research in rubber technology on problems of the industry. (2) Trains professional men for industry through an undergraduate curriculum in rubber technology. (3) Makes available courses on rubber technology in evening classes to accommodate technical personnel in industry. (4) Provides extensive equipment to carry on adequate and meaningful educational and research programmes. (5) Guards the long-range personnel needs of the industry through present-day training of educators in the field of rubber technology. (6) Makes available to industry a complete library on rubber technology.

PHILIP SCHIDROWITZ

Statistical Bulletin

The February issue of the Rubber Statistical Bulletin, issued by the Secretariat of the International Rubber Study Group, Brettenham House, Lancaster Place, London, W.C.2, is notable for the large number of alterations and additions which have been made. The additional information concerns mainly synthetic rubber but some alterations refer to natural and reclaimed rubber. There has been considerable rearrangement of the tables.

Additional information for synthetic rubber includes export data by months and years for Germany (Federal Republic), France, Italy and the UK. Columns for synthetic rubber production in the UK, Italy, France, the Netherlands and Japan have been included.

The Rubber Statistical News Sheet, also published by the Secretariat, contains a good deal of extra information, and has a section: 'Latest Figures.' Annual subscriptions are, for the Bulletin, £3 annually ($8.50) and for the News Sheet £1 ($3). The comprehensive changes have added greatly to the valuable service of the Study Group.

MEN *and* MATTERS

A Review of People and Events

by George A. Greenwood

IN the current spread and growth of industry there is always cropping up the problem of business houses requiring to carry on their trades not very far away from residential areas. Within my own knowledge instances have lately developed in Yorkshire, in Oxford and the West Country, and a little while ago Edwin Gornall Ltd., Britannia Works, Radcliffe, near Manchester, came into the same picture. Residents in the neighbourhood of their works complained that the company's scrap rubber dump was a nuisance — although the precise nature of the nuisance is not specified—but in order to avoid further complications, the company has now taken over Cardigan Works, in the same town, and they are re-naming them Sovereign Works. Mr Edwin Gornall tells me that the storage of rubber tyres which has been the subject of complaint in the Bolton Road area, is now being moved to these new works.

Edwin Gornall Ltd. is something of a phenomenon. The company started up as export rubber waste merchants, with Mr Gornall at the head, and with one man assisting him, only about 18 months ago. It now employs 40, and needs extra accommodation to cater for increased business. I should add that the head office will continue at Britannia Works and that operations will still be carried out there. At any rate, Mr Gornall can be satisfied now that the change-over has the approval and confidence, after debate a week or so ago, of the Radcliffe Town Council, and that should suffice. But the fact remains that in these new processes not only of expanding industry but the housing of the people, such issues are bound to arise, and it is not in every case, as in that of public-spirited Mr Gornall, that an alternative can so readily be found.

Portable Oasis

Details of a special order given by the Geophysical Expedition to Saudi Arabia are not without interest. Involved is the making of two unusually large flexible tanks for storing drinking water under desert conditions, which have just been completed by Fireproof Tanks Ltd., of the Airport, Portsmouth. They have used, I am told, nitrile rubber made by British Geon Ltd. To meet requirements, the tanks had to be made to hold 1,500 gallons each, to be collapsible, and transportable.

The outer cover of the tanks was made with a Hycar/nylon laminate which combines very high mechanical strength with abrasion resistance, whilst retaining its flexibility at extremes of temperature. An inner liner of a specially compounded rubber ensures that the water remains fresh and palatable for a considerable period. The dimensions of the tanks when full are 12ft. by 11ft. by 3ft. When empty, each tank weighs just over 2cwt. and both can be packed in a wooden crate measuring 12ft. by 3ft. by 1ft. The weight of crate and the two tanks is little over 6cwt. All in all, very useful adjuncts to a desert safari.

Try Out by the 'Spurs'

And here is another story of interesting experiment, in this case in the realm of football. It appears that Mr Bill Nicholson, the manager of Tottenham Hotspur, concerned last month at the effect of the weather's vagaries on sport, happened to remember that in the late winter of last year over 60 League and Cup matches were postponed owing to the weather. He remembered, too, that during his visit to Russia he saw a Moscow team's ground covered with a plastic material. Followed then a conversation with Fablon Ltd. These makers of polythene film were asked whether they could do the same for the Spurs. The company said they could and they would. It was agreed that, as an experiment, a single sheet of the film should be made that would cover a third of the ground. Fablon supplied 10 strips of 500 gauge clear polythene film—4 yards wide and 75 yards long—and sent it to Ashford, Kent; to a firm of plastic film converters, Messrs Fotofile.

It was the largest continuous sheet of polythene film this firm had ever made, but in less than a week the strips had been welded together into one, and on a subsequent morning, the Tottenham players interrupted their training to lay it at White Hart Lane.

It would, I am assured, take less than an hour to lay polythene over a whole ground, making it independent of the weather—at a cost of approximately £975. I might add that according to my information, the relative cost of protecting some other forms of sporting lay-out, as for example, cricket pitches, can now be done for as little as £7.

The Eclipse in Car Racing

Motor car racing, in relation both to the rubber industry and human affairs is much in the news just now. Following the example of three or four other tyre producing organizations, the Avon Company has joined in by withdrawing from racing. The

A one-day conference and exhibition was held recently at the Washington Hotel, London, by Commercial Plastics Ltd. for the directors and merchandisers of the Great Universal Stores (G.U.S.) group. The picture shows Mr Isaac Wolfson, chairman of G.U.S. (*left*) and Dr J. Pomeraniec, managing director of Commercial Plastics Ltd.

reason is made clear in the company's official announcement, which says 'Motor racing seems about to enter a period of consolidation and Avon intend to do the same, devoting their energies to the practical application of the lessons learned during the last five years.' But, also like other manufacturing concerns, Avon is to continue to take part in British and Continental motor cycle racing.

Hard on the Hand

If I had a section entitled 'Sayings of the Week' I could not resist the temptation to quote the following, attributed to Mr J. F. Powell when speaking to the Leicester Section of the IRI: 'A Durometer is a small instrument which you can hold in your hand and press against a piece of rubber. A dial on the instrument shows you how hard you are pressing.'

Yuiop Qwert?

In case you ever want your secretary to type out backwards an astrological forecast in Telegu or Gaelic, I can tell you just the man to go to. Frank Miller, managing director of Royal typewriters, tells me that his firm has now accumulated well over 100,000 special characters, which include musical notes, weather signs, money, medical and astrological symbols. Some firms have a key designed for their trade marks. Firestone, for instance, have a key which types out their characteristic 'tyre-tread' F. This seems to me to be a good publicity idea, and Royal tell me that they will design such a key free for any organization buying their typewriters.

American for Australia

Mr Arne Melby has been appointed project manager for the construction of a B. F. Goodrich Chemical Company vinyl plant in Australia. In his new assignment, Melby will supervise the design, construction and initial operations of the plant built in co-operation with Australian interests.

Melby, a native of Duluth, Minnesota, joined The B. F. Goodrich Company in 1940 as an analytical chemist. From 1943 to 1946, he was general foreman at the Borger, Texas, synthetic rubber plant operated by the company for the Government. In 1957, Melby was assigned to supervise construction of a synthetic rubber plant built by Japanese Geon Ltd.—an associate company of B. F. Goodrich—at Kawasaki, near Tokyo. He is a member of the American Institute of Chemical Engineers and the American Chemical Society.

Obituary

Not before it is too late let me mention the death, which took place when he was literally in harness just a little time ago, of Sir Bernard Lomas-Walker, at the age of 79. He was, and had been for a generation, an outstanding figure in the public, legal and industrial life of the North of England in general, and in Yorkshire in particular. Sir Bernard collapsed and died when presiding over a board meeting of Cresswell's Asbestos Co. Ltd., of which he was chairman, at Wellington Mills, Laisterdyke, near Bradford—a company through which associations he had become well known in rubber and plastics.

Decorative Talk

Edlon Machinery Ltd., New Ruskin House, 28-30 Little Russell Street, London, W.C.1, tell me that they are organizing a practical lecture accompanied by slides, and an exhibition of components printed on modern silk screen printing machines, on Tuesday April 5 at 2.15 p.m., at No. 4 Whitehall Court. Chief Engineer M. Else, of the Kammann Factory in Germany, will talk on the decoration of industrial articles by silk screening.

This talk should be interesting to plastics manufacturers as decoration printing often proves quite a problem. I understand that Kammann have developed a range of machines that simplify these problems, and the talk should certainly contain something new for most of us. Any readers wishing to attend should send their names in to Edlon Machinery Ltd.

Question Corner—109

(Second Series)

434. For what purposes have urea mouldings been developed and what are their properties?

(Answer next week)

Answer to Question Corner—108

433. Rotational moulding is, in fact, a form of slush moulding. A predetermined amount of plastisol is introduced into one half of a two-piece mould, and the two parts are then clamped together and rotated in two planes. After the plastisol has been evenly distributed on the inner wall of the mould it is heated to gel the material.

The simplest type of equipment consists of a platform which rotates in two dimensions simultaneously and is enclosed in an oven so that the mould can be heated while rotating. The moulds are filled outside the oven, clamped on to a plate which is locked on to the platform in the oven. A continuous type of equipment has been developed and it is highly mechanized and complicated.

The advantages of this method are that the weight of the moulded parts can be accurately controlled, there is less risk of contamination of the plastisol as there is no filling of the mould and pouring off the surplus, reject rate is lower and the whole operation is cleaner.

The moulds are either electroformed copper or cast aluminium, which may be polished when a high-gloss surface is required on the finished product. Typical products which can be produced with this method are toys, dolls, balls, valves and advertising items.

(Another question next week)

Polly Ester Says . . .

'Elongation at break—the time the chairman takes for lunch'

Poly-V Drives

GROOVED RUBBER BELT MEANS BIG ADVANCE

WHAT is called a landmark in the development of power transmission was announced last week by Turner Brothers Asbestos Co. Ltd. (a member of the Turner and Newall Group). Called the Poly-V drive, it consists of a flat belt of synthetic rubber with a series of parallel V-shaped ribs moulded on its inner surface. (The diagrams show a cross-section of the belt.) These ribs form the driving surface of the belt and completely fill mating grooves on the pulleys, there being no clearance between the two.

Two big advantages are claimed. Firstly, the load-carrying member extends across the full face of the drive, and secondly the grooved inner face of the belt has about twice the surface area in contact with the pulleys when compared with a multiple belt drive of similar width.

These two principal features mean that the Poly-V drive can transmit the same load in less space or a greater load in the same space as a multiple belt drive. In fact, Turner Brothers claim that Poly-V will increase drive capacity by about 50%.

Neoprene has been used for the belt and was chosen for its heat and oil resisting properties.

A strength member made from high tenacity synthetic cord runs through the belt; the cord is specially treated to get the maximum amount of adhesion between it and the body of the belt. The base rubber (that of the ribs) is softer than normally employed in 'V' belt constructions. This allows it to act somewhat like a hydraulic fluid, completely filling the pulley grooves during belt embrace and exerting an *even* pressure, all over the rib face, which should give uniform wear for both belt and pulley. The rib faces are covered with cover cloths or, in the case of the smallest belts with special compounds containing a high proportion of fibre.

The drive is made in three sizes, the J. L and M sections, having rib widths of $\frac{3}{32}$in., $\frac{3}{16}$in. and $\frac{3}{8}$in. The V-angle is 40°. J sections will find applications in light machinery, and seem likely to make a significant entry into the domestic market—refrigerators, washing machines, etc.—since there is claimed to be a marked reduction in the vibration normally present with belt-driven units.

The drive was developed in America by Raybestos-Manhattan Inc., and Turner has bought, under licence, the exclusive manufacturing and selling rights in the UK, and non-exclusive selling rights in the rest of the world, except for America and France. Turner expected to commence production of the new drive in May this year; until that time they are selling American-made belts.

NEW GOODYEAR TYRE ANNOUNCED

Goodyear announce the production of a 6-ply Ultra Grip tyre suitable for vans and the heavier makes of cars. This, the company says, follows the success of their 4-ply 'beat-the-weather' Ultra Grip tyre.

Features of the new tyre are said to be extra powerful shoulders and a heavy, powerful tread to ensure more pull through traction in snow, ice, slush and mud; more surface traction when roads are wet and slippery; more hold and stability when cornering. Like the rest of the company's car tyre range, carcass of this 6-ply tyre is built with Goodyear 3-T cord.

Sizes are (tube type) 5.90-15; 6.40-15; 6.70-15; 6.00-16 and 6.70-16. (Tubeless) 5.90-15 and 6.40-15.

Compounding Problems

NCRT COURSE

THE fourth lecture in the series at the National College of Rubber Technology on Compounding Problems, entitled 'Non-black Reinforcement,' was given by Mr J. R. Pyne of the Research Association of British Rubber Manufacturers, Shawbury. After discussing criteria of reinforcement, the lecturer compared the physical properties imparted to rubber vulcanizates by various loadings of five types of material: carbon blacks; silicas; clays; precipitated silicates; and other materials including calcium carbonates and the 'older' white reinforcing agents such as zinc oxide and magnesium carbonate. Comprehensive data has been published for natural rubber but for SBR the data is fragmentary.

Problems connected with some of the newer white fillers included bulk and dusting troubles, possible toxicity (lung hazard), and deterioration in damp storage conditions. Some were difficult to incorporate and showed retardation of cure by adsorbing sulphur and accelerator. Hydrophilic additives such as glycols alleviated both these problems. Compression set produced was higher than with blacks and this had been a major factor retarding the development of coloured butyl rubbers which had other properties of great technical importance. Main applications had been in shoe soling compounds although difficulties in curing thick soles had retarded progress in the direct vulcanization process. By use of special systems (*e.g.* omitting fatty acid, using low concentrations of fine particle size zinc oxide and accelerating with ZDC/HMT), transparent or translucent silica reinforced rubbers might be produced.

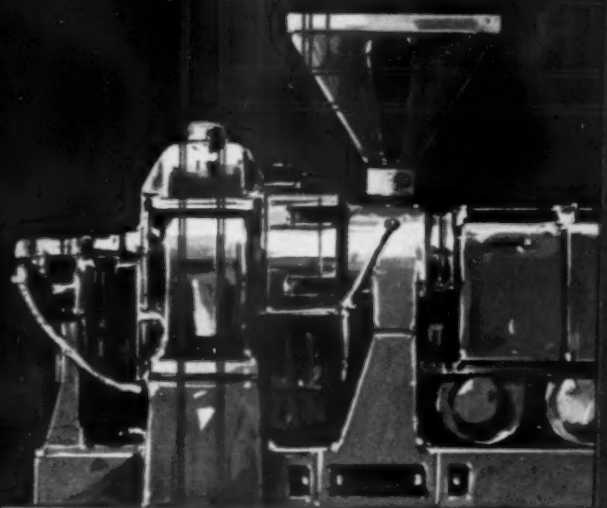
The discussion covered dispersion troubles with silicates of very low or very high moisture content; the need or otherwise for glycols when using aluminium silicate; the cost/efficiency comparison of glycols v. triethanolamine; and the general uses of HMT as an activator outside the field of translucent rubbers.—D. A. S.

PI Conference Dinner

The Plastics Institute has organized a dinner to be held at the Connaught Rooms, London, on Wednesday evening, March 30 1960, on the occasion of the 'Polymeric Progress' conference. Any member who would like to attend the dinner may apply to do so, whether or not he registers for the conference.

Professor Sir Robert Robinson, O.M., F.R.S., a past-president of the Royal Society will propose the toast of the Institute, and Mr F. J. Erroll, M.P., Minister of State, the Board of Trade, the toast of the plastics industry and the overseas visitors. Overseas delegates are expected from the following countries: Belgium, Czechoslovakia, France, East and West Germany, Holland, Hungary, Italy, Sweden, Switzerland, USSR, and USA.

lay-flat line for
blown polythene shee



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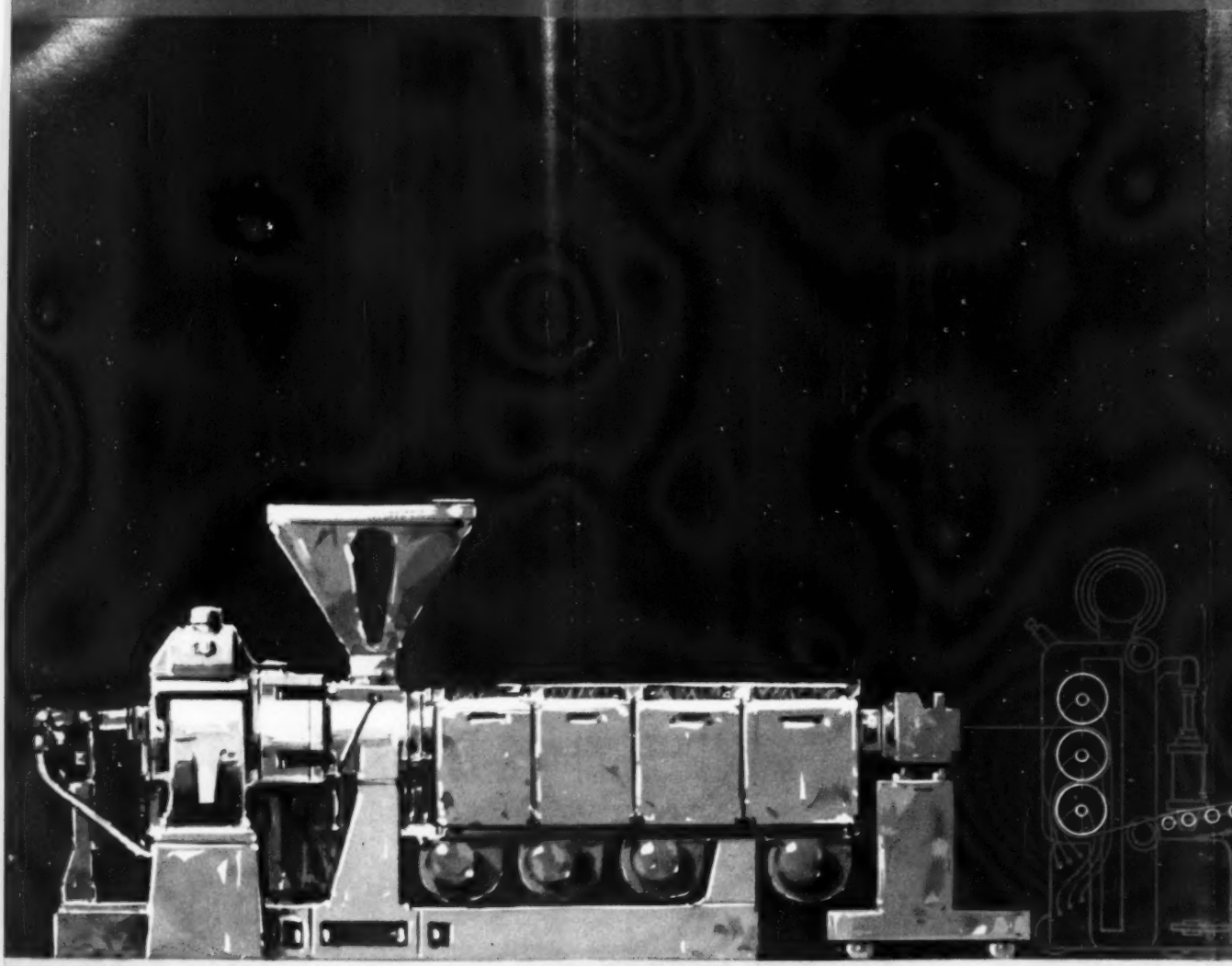

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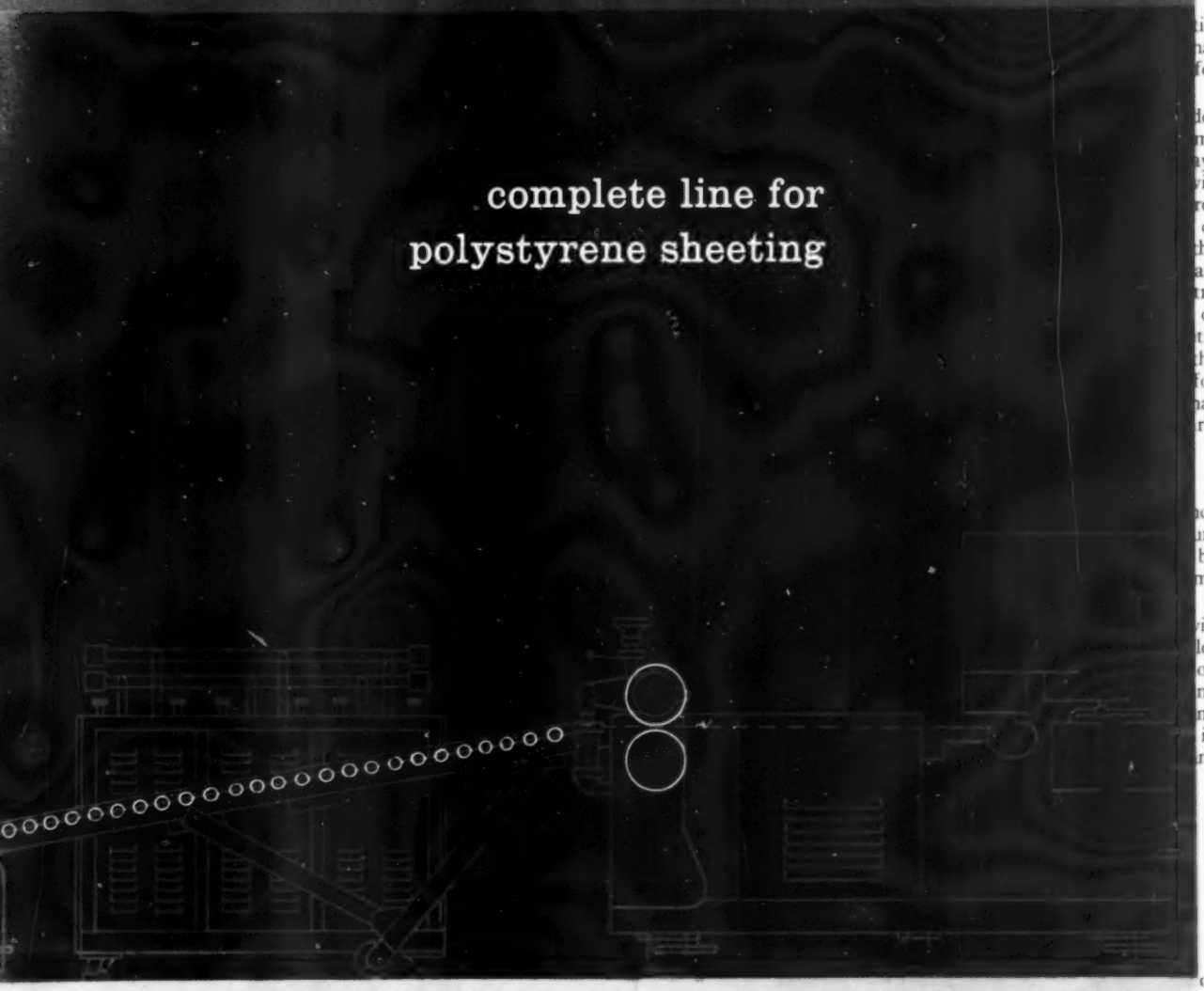

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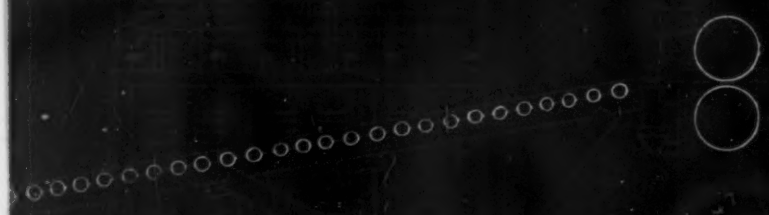

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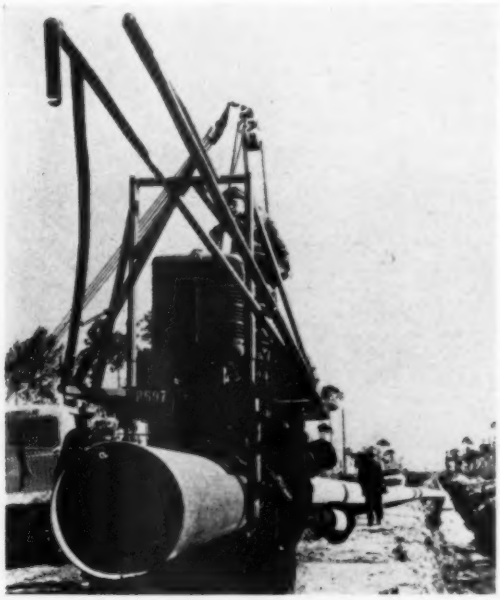
NTS THROUGHOUT THE WORLD

41,000,000 sq. ft. of Polythene

WHAT is said to be the largest single pipeline protection project ever carried out is almost complete. It is the encasing of 1,616 miles of mainline and 702 miles of laterals



Automatic wrapping machine applying protective polythene tape to a natural-gas pipeline. The tape is covered with an outer-wrap, providing mechanical protection for the tape during the lowering of the pipe and backfilling of the trench

section of the Texas-to-Florida natural gas pipeline in a polythene sheath to protect the line from corrosion.

Use of the tape, manufactured from Union Carbide's polythene, saved the Houston Texas Gas and Oil Corporation more than $500 per mile over the conventional protective coatings such as tar, or more than $800,000 for the 1,616-mile section. It is expected that maintenance costs also will be lower.

Besides protecting the pipe from oxidation, the properties of polythene as an electrical insulator helps protect it from galvanic corrosion, which arises when a current is set up between the steel pipeline and oppositely-charged components in the surrounding soil. This type of corrosion is further prevented by applying a slight opposing electrical potential across the pipeline.

Using the tape allows the pipe to be laid and covered with less distance separating the welding crew at the front of the operation, from the crew which covers the pipe after taping is complete, than was the case before. A single piece of power equipment cleans the line and applies the tape. This speedy operation (in one day on the Florida job, 17,000ft. of line was taped by a single machine and crew) contrasts with other coating methods, which require long drying periods before the pipeline can be covered. This factor was particularly important in sandy, marshy terrain where cave-ins were frequent, engineers on the Florida project reported.

Barrow Buy Colloids

Barrow Hepburn and Gale is acquiring all the share capital of Colloids, of New Jersey, US, specialists in the manufacture of a synthetic sizing material for the textile industry, which Barrow Hepburn has made in the UK under royalty for over two years.

The purchase, which is of the order of £225,000, will not mean any immediate issue of further capital, says Mr G. W. Odey, chairman. It will facilitate the pooling of research resources and the development of markets, and follows references in the chairman's statements for the past three years to Barrow Hepburn's entry into the field for the manufacture of sizing materials based on synthetic resins, which is supplementary to the manufacture of technical gelatine for the textile industry in which it has been actively engaged for many years.

ASTM on Skidding

A new approach to skid-resistance measurement—use of standard surfaces of known slipperiness—will be attempted by a new ASTM Committee, E-17 on Skid Resistance.

The committee's primary task will be to develop standard test vehicles and standard surfaces for calibration purposes. The organization meeting of the committee will be held during the 1960 ASTM Annual Meeting in Atlantic City, N.J., the week of June 26—July 1.

Reinforced Plastics

LONDON VENUE FOR 2nd INTERNATIONAL CONFERENCE

THE venue for the second International Reinforced Plastics Conference (November 30 to December 2 1960) is to be the Café Royal, London, it was announced by the British Plastics Federation this week.

The programme for this conference is being designed to be of special interest and help to fabricators in reinforced plastics, with the emphasis on practical information.

Production practice is to be covered in papers dealing with open lay-up moulds and moulding; considerations in the use of resin glass deposition equipment; moulding of reinforced plastics in matched metal tooling; and winding. Costing is to be discussed.

Recent advances in materials, processes and design are also to be discussed in papers on the properties of glass for plastics reinforcement; synergistic or complementary action of mixed catalysts, and the effects of heat and mechanical strain on the electric strength of various glass-fibre laminates.

In addition, because electrical, marine, atomic and structural engineering are among the industries making more and more demands on reinforced plastics, papers devoted to their specialized needs are being included in concurrent sessions.

Fuller details of the programme will be announced soon. In the meantime, delegates interested in attending the conference should write for particulars to the British Plastics Federation, 47/48 Piccadilly, London, W.1.

Mr P. R. Rutherford has resigned from the Board of North Hummock (Selangor) Rubber Company.

POLYAMIDE AND RUBBER MATERIALS

Continued from page 418

materials more hydrophobic, widens the temperature range of elasticity, increases ageing resistance, and makes it possible to control the electrical conductivity of the materials as desired.

Conclusions

1. The advantages of building up materials with a laminated arrangement of polyamide film and a covering of chloroprene rubber are demonstrated.

2. The construction of single-layer and two-layer materials of polyamide film and polychloroprene rubber is worked out.

3. Procedure is worked out for the building up of single layer and multilayer parallel and transversely plied-up materials.

4. The authors investigate test specimens and demonstrate that the combination of rubbers with plastics makes it possible to enhance a number of properties of the plastics and to form materials with improved service properties.

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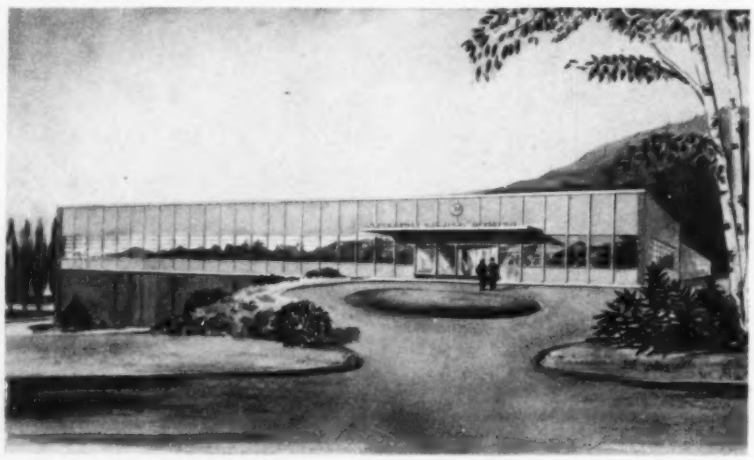
Built On Its Own Research

THE new technical service centre to be constructed at Connecticut by the Naugatuck Chemical Division, US Rubber Co. (*RJIP*, March 5) will use many of the rubber and plastics architectural products developed by the division.



Window glazing is being made from polyester resin reinforced with glass fibre, which will be used across the entire front of the building in modern curtain wall type of construction. The unbreakable, coloured panels transmit even, diffused light. Decorative translucent panelling made of the reinforced resin will be used for some interior partitioning. Chairs will be upholstered in PVC and Naugawall, a new type of wall covering made from Marvinol vinyl resins, will be used in many areas as will the new vinyl-metal laminates produced by the division's Marvibond process. Vinyl floor tile will be the major floor covering.

Piping made from a rubber-plastic blend will be used in many of the laboratories, and brick glazed with a polyester coating will form the walls in the locker rooms.

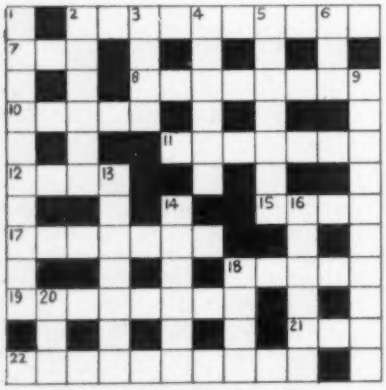
The centre will have approximately 37,500 sq. ft. of floor space and will be equipped with the most modern machines available for testing rubbers, chemicals and plastics. It will also house equipment on which new products can be produced and tested under operating conditions which simulate actual production line techniques. It will be staffed with about 100 scientists and technicians from the division's research and development department.

Excess Capacity

British Insulated Callender's Cables is to take a further step in concentrating its manufacturing facilities. The manufacturing and marketing activities of the St. Helens Cable and Rubber Company, a member of the BICC group, are to be integrated with those of BICC as from June 1. The company states that supplies to St. Helen's customers will be safeguarded in every way.

The action has been taken, according to BICC, because of the excess manufacturing capacity within the cable industry and the need for concentration due to highly competitive conditions.

RJIP CROSSWORD



CROSSWORD No. 71

CLUES ACROSS

2. An important property of rubber which is soft at first.
7. A drink.
8. Precise determinations.
10. Descriptive of a country district.
11. They're delivered in the morning.
12. Cook.
15. Nothing but a tender feeling.
17. Clear away.
18. Put me back at the end to correct.
19. Rubber, sulphur, accelerator, antioxidant, etc., go to make up this.
21. A softener for rubber.
22. To infuse rubber into textiles.

CLUES DOWN

1. Rubber in France.
2. This is often found on the beach.
3. Lana takes a turn for him.
4. Annoy to a T for tea.
5. If it is easily understood, it is as clear as this.
6. We all have a big and a little one.
9. American braces.
13. A seal has two and other swimmers have rubber ones.
14. Tennis rackets are a small street initially.
16. A famous female secret agent.
18. The Dane gives her away.
20. A unit of resistance.

(Solution appears on page 451)

Rubber Statistics

WORLD POSITION AT THE END OF 1959

THE Secretariat of the International Rubber Study Group has just issued preliminary details of the world rubber position up to the end of the year. The table which follows shows the natural rubber production and consumption totals for the year (in 1,000 long tons):

NATURAL RUBBER

	Dec. 1959	Jan./Dec. 1959	Jan./Dec. 1958
Production ..	200.0	2,065.0	1,957.5
Consumption..	185.0	2,105.0	1,980.0

Stocks at December 31:	Change since Jan. 1 1959
In producing areas ..	255.0 – 37.5
In consuming areas ..	202.5 – 15.0
Afloat	230.0 + 5.0
	687.5 – 47.5

According to the Study Group, the December consumption total includes estimated imports into the USSR of 23,500 tons and into China of 19,750 tons. The Group estimates that, up to the end of the year, these two countries had taken 232,250 tons and 134,750 tons respectively of the total amount of natural rubber consumed during the year, *i.e.* 367,000 tons in all or about 17%. During 1958 they took together 357,750 tons or about 18% of the total quantity of natural rubber consumed during that year. The increase in overall natural rubber consumption last year, compared with the 1958 figure, was of the order of 6%.

Stocks of natural rubber fell during the year by 47,500 tons, the decline being most pronounced in stocks held in producing areas (37,500 tons), while stocks afloat actually increased by about 5,000 tons.

Synthetic Rubber

The synthetic rubber position is set out in the following table:

SYNTHETIC RUBBER

	Dec. 1959	Jan./Dec. 1959	Jan./Dec. 1958
Production ..	155.0	1,627.5	1,242.5
Consumption..	132.5	1,557.5	1,247.5

	Change since Jan. 1 1959
Stocks at December 31	310.0 + 52.5

The overall increase in synthetic rubber consumption during the year of 310,000 tons is of the order of 25%.

Total rubber consumption during 1959, both natural and synthetic amounted to 3,662,500 tons, compared with the 1958 total of 3,227,500 tons. Natural rubber accounted for 57% of this total, synthetic for 43%.

US General Position

The US Department of Commerce has issued the following preliminary statistics for the month of January (in long tons):

NATURAL RUBBER

Consumption:
46,350 tons of which latex 5,487 tons
Stocks:
76,156 tons of which latex 12,789 tons

SYNTHETIC RUBBER

	Production	Consumption	Stocks
S-type ..	106,853	78,902	183,242
Butyl ..	8,171	6,006	13,838
Neoprene ..	11,958	7,279	14,985
N-type ..	3,760	2,861	9,403
	130,742	95,048	221,468

Total new rubber consumption during November amounted to 141,398 tons, compared with a total of 132,002 tons in December, with natural rubber accounting for 32.78% of the total. Total US consumption to the end of December had amounted to 1,626,370 tons, an increase of some 260,000 tons over the previous year's total, while natural rubber had accounted for 34.13% of the whole compared with synthetic rubber's 65.87%.

British North Borneo

The Study Group has recently issued details of exports of rubber from British North Borneo for the last quarter of 1959. These amounted to 6,414 tons, and brought the year's exports to 22,890 tons, compared with the previous year's export figure of 20,235 tons. The largest quantity of these exports went to Japan, which took 7,424 tons, and was closely followed by Singapore taking 7,287 tons. Other countries to take appreciable quantities included the UK (3,486 tons), Western Germany (1,269 tons), Hong Kong (938 tons), and the USA (705 tons).

United Kingdom

Figures recently published show that the UK imported 12,658 tons of synthetic rubber during the last quarter of 1959, bringing total imports of synthetic rubber during the year to 38,381 tons. Of this quantity, the bulk came from the USA (19,128 tons) and Canada (17,448 tons); but small shipments were also received from Italy (355 tons), Belgium (284 tons) and Western Germany (49 tons). Re-exports of synthetic rubber during the year totalled 67 tons.

CORRESPONDENCE

Matthew Boulton College

To the Editor

Sir,—The Council of the Institution noted, at their last meeting, that for the first time in Birmingham's history a part-time course, combining both theory and practice, is now available at the Matthew Boulton College and that a small group of students had enrolled for the course commencing January 1960.

The Council wishes to express grateful thanks to those who have made this much-needed development possible—to the Dunlop Rubber Co. Ltd., for loaning equipment; to Robinson Bros. Ltd., for placing their rubber laboratory facilities at the disposal of students, and to the educational authorities for providing the teachers. Special thanks are also extended to the directors of Francis Shaw and Co. Ltd., for generously agreeing to overhaul the equipment at the College.

The Council wishes me to draw attention to the fact that the College is still sadly under-equipped and that offers of further machinery and testing appliances from manufacturers of equipment and from rubber manufacturers would be most gratefully received.

Yours faithfully,
GEO. MARTIN,
Chairman of Council.
Institution of the Rubber Industry,
London, March 14 1960.

Sir Bernard Lomas-Walker, chairman of Cresswell's Asbestos Company, has died. He was 79.

This new David Bridge 84" Mixing Mill was installed in less than four weeks by the engineering department of the Phoenix Rubber Co. Ltd., Slough

PATENT SPECIFICATIONS

The following information is prepared from published Patent Specifications by permission of the Controller of H.M. Stationery Office. The full Specifications can be obtained from the Patent Office, 25 Southampton Buildings, W.C.2, at 3s. 6d. per copy (including postage).

Resilient Mounting

No. 825,668. Howard Clayton-Wright Ltd. Inventors: E. Roberts and R. R. Webb. Application, April 30 1957. Filed, February 27 1958. Published, December 16 1959.

The construction of the mounting is shown in the two Figures, Fig. 1 being

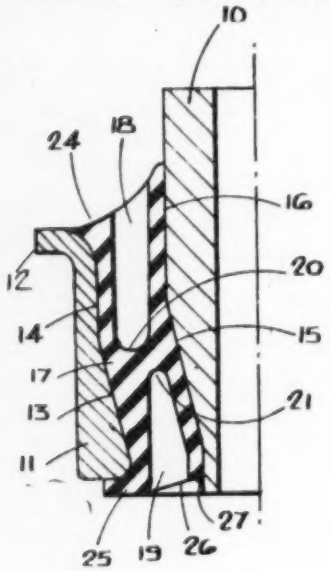


Fig. 1

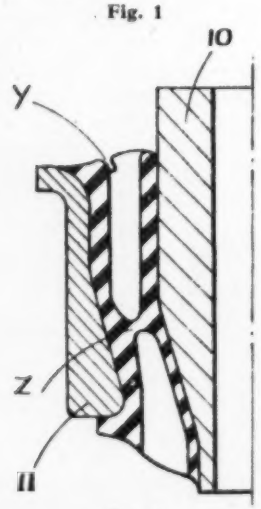


Fig. 2

a cross section through one half of the mounting when not under load and Fig. 2 a corresponding section when the mounting is under load.

The mounting comprises inner and outer metal sleeves 10, 11, with a sleeve of rubber 17 disposed between and bonded to them. The part which is to be supported by the mounting is suitably secured to the upper end of the sleeve 10 while the sleeve 11 is supported in the chassis or base frame or other mounting upon which the part is to be supported.

The outer sleeve 11 has on its inner surface a frusto-conical formation 13 extending over substantially its lower half with its upper half 14 of plain cylindrical form, while the inner sleeve 10 has a frusto-conical portion 15 opposed to the portion 13 over its lower part and a plain cylindrical portion 16 over its upper part. The rubber sleeve 17 is formed with a number of passages 18 and 19 which extend inwardly from each end of the rubber sleeve and are spaced at equal angles around its axis. A preferred number of such passages is eight, that is to say eight extending from one end and a corresponding eight extending from the other end. The inner ends 20, 21 of the passages 18, 19, are of rounded form.

The passages 18 and 19 permit displacement of the rubber in a manner which results in a more uniform stress disposition over the whole of the rubber instead of the stresses being localized at one or two points as in the case of a solid rubber sleeve. The presence of the passages also increases the surface area of the rubber and so provides for dissipation of any heat which may be generated under extreme working conditions.

Shorter Abstract

Tubeless Tyre. 821,244. The Firestone Tire and Rubber Co. Filed, May 9 1956.—A liner for a tubeless tyre is formed of a copolymer of a conjugated diene and an unsaturated acrylate. A copolymer of butadiene and methyl methacrylate is preferred.

Plastics Materials Sales

IN reporting last week the 1959 figures for the net sales of plastics materials, at a record of 501,000 tons, mention was made of the high average rate of growth over the last nine months of the year. The quarterly figures below, issued by the Board of Trade, clearly illustrate this.

The figures were compiled by the Board of Trade from returns from over 160 firms known to have been manufacturing plastics materials, whether for sale or for use in the production of plastic goods or incorporation in other goods (*e.g.* paint) containing plastics materials. Firms making cables who manufacture plastics materials from purchased resins are excluded. Materials for use as textiles are also excluded. The figures are free of duplication or double counting of plastics materials at different stages of production.

NET SALES OF PLASTICS MATERIALS, 1959

	Quarter (*in Thousand Tons*)				
	October-December 1958	January-March 1959	April-June 1959	July-September 1959	October-December 1959
Thermosetting materials:					
Alkyds	11.2	11.5	13.0	12.4	12.8
Aminoplastics	13.3	12.6	13.2	13.2	15.7
Phenolics and cresylics	17.7	17.3	18.3	16.8	20.9
Polyesters	1.4	1.5	1.7	1.7	1.9
Other (a)	1.7	1.8	2.1	2.0	2.5
Total thermosetting	45.1	44.7	48.3	46.1	53.8
Thermoplastic materials:					
Cellulose plastics	2.9	2.6	3.0	2.9	3.2
Polyvinyl chloride (b)	20.5	20.2	24.3	21.4	22.4
Polystyrene	9.2	8.5	10.2	9.8	10.8
Polyvinyl acetate	2.7	3.0	3.8	3.0	3.4
Other (c)	34.5	34.3	38.1	37.7	45.4
Total thermoplastic	69.8	68.6	79.3	74.8	85.2
Total, all plastics materials	114.9	113.3	127.6	120.9	139.0
Stocks at end of period:					
Thermosetting materials	16.2	16.7	16.1	17.1	17.3
Thermoplastic materials	38.4	40.8	39.2	43.0	44.4

Note: Any apparent discrepancies are due to rounding of figures.
(a) Including epoxide resins and casein plastics.
(b) Excluding sales of resins (*i.e.* polymers sold as such).
(c) Including acrylics, polyamides, polytetrafluorethylene, polyethylene, polyvinyl chloride resins (*i.e.* polymers sold as such).

Companies in the News

Bakelite

Group profits of Bakelite rose from £809,836 to £1,542,750 in 1959, and the total dividend is increased by 2½% to 17½% with a final of 11¼%.

After depreciation £292,196 (£271,378), debenture interest £46,362 (£48,519) and tax £590,350 (£250,609), the group net profit of £613,842 compares with £239,330 previously.

Cover for the dividend is 3½ times and suggests that profits are being ploughed back for future projects. The annual general meeting is scheduled for April 28.

BIP Record Profit

The net profit of the British Industrial Plastics group, after depreciation but before taxation, amounted to £802,916 for the year ending September 30 1959. This is an increase of £104,302 over 1958, and a record for the group.

At the annual general meeting on March 10 the chairman, C. H. Glassey, said that during the first six months of the year turnover was lagging a little behind comparable figures for the preceding year, and with some reduction in profit margins the overall results were not encouraging.

In the latter half of the year, he said, the situation changed completely and this resulted in such increased demand for BIP's products, both chemical and engineering, as taxed their manufacturing resources to the limit.

The effect of this upsurge of business was reflected in the final accounts for the year.

In order to assess on a long-term basis the future prospects upon which the policy of expansion was being formulated, he said, senior executives of the BIP Group had spent an increasing amount of time on overseas visits, evaluating the export markets.

In the course of the year they had made some 97 journeys abroad, visited 25 different countries, and travelled upwards of 350,000 miles.

Analysis of their reports showed clearly that, based on quality, price and technical service, there was an expanding export market for all products of the Group, which would supplement the increasing demand on the home market.

To meet the competitive situation which was now so evident, Mr Glassey said, a number of steps, still further to effect economies, had been taken, and these were reflected in the increased capital expenditure, both realized and projected.

Northwestern Rubber

The Northwestern Rubber Company (rubber reclaimers) announces a dividend of 12½% for the period ending December 31 1959, the same annual rate as the previous year's 10%. A one-for-six rights issue at 7s. 6d. per 5s. share is also proposed.

The trading surplus is £66,522, compared with £52,872, and the net profit of £20,011 compares with £13,322, after tax of £4,634 (£11,296). The carry-forward is £44,532 (£39,173).

UAM Expansion Forecast

Frank W. R. Douglas, Chairman of the UAM Group, in his statement to shareholders on March 7, said the 25-acre site of their main factories at Watford has now been fully developed and that they are endeavouring to acquire an adjacent acreage.

At present, he said, business conditions remain good, even showing an improvement, as compared with those of last year. The additional asbestos cement plant installed at Watford had come into production only at the end of the financial year, 'but is now fully employed in meeting orders, which, in exactly the same way as I reported a year ago, exceed our present resources.' The demand for other products—pitch fibre pipes and plastics translucent sheets—was being satisfactorily maintained. The turnover of the group has grown, and profits are up.

Mr Douglas reported that UAM had recently started to operate a new mechanical pipe plant, which was gradually coming into fuller production, and in the course of the next few months output of asbestos cement pipes should increase. The productive capacity of UAM plastics had doubled during the year and, he said, the future was bright, since additional and improved machinery was due to come into operation in July.

Asbestos

Shipments of asbestos from Canadian mines in January showed wide gain. The shipments were one-fifth greater than a year ago at 65,581 tons, compared to 54,703. The shipments from Quebec mines advanced over 18% to 59,739 tons from 50,593. A few weeks ago, announcement was made of the re-opening of three mines in the Thetford Mines, Quebec, area which had been closed for some time.

Rigid Vinyl Windscreen

In a test run from England to the Arctic and back, the well-known Birmingham test rider 'Flash' Rogers and his companion covered a distance of 4,800 miles on an NSU 'Prima' Scooter, upon which was mounted a 'Cobex' rigid vinyl windscreen.

Throughout the entire test the screen gave good service, and withstood high and low temperatures, accidental knocks, high winds and tremendous vibration caused by bad road surfaces.

The screen was fabricated by Stratford Auto Components Ltd., of Stratford-upon-Avon, from Cobex rigid vinyl which is manufactured by BX Plastics Ltd., Higham Station Avenue, Chingford, London, E.4.

Seen here on its return from the Arctic trip is the 'Prima' scooter. The BX Plastics 'Cobex' rigid vinyl windscreen shows no signs of wear after a test which involved many rigours

Plantation Share Survey

SINCE we last reported there have been some interesting chairman's reports to shareholders, a number of take-over rumours, production figures for January and, of course, the usual round of news from company boardrooms.

Taking them in order, we feel that the remarks made by Sir John Hay, chairman of LINGGI PLANTATIONS, in his annual report to shareholders must take precedence if only because of the recent disappointment with the company's dividend decision. Sir John said that the fact that the demand for natural rubber should continue at a level sufficient to absorb all production at a time when ample supplies are available at a lower and more stable price, was both significant and encouraging. The directors believed that demand over 1960 would continue at a high level, and that releases from UK and USA stockpiles at the present moderate rate would serve only to replenish trade stocks, which had fallen below what might well be regarded as normal in relation to current consumption.

Sir John said that it was difficult to know what significance should be attached to the Russian declaration of intention to liquidate stock. 'It would not be surprising if the true intent is merely to release some of the stock to satellite countries for the requirements for which the original purchases were made.' Referring to the big rise in profits, he told shareholders that they were achieved because of an unusual combination of favourable factors. Rubber crop exceeded estimates, reaching a record of nearly 10½m. lb. and was harvested at a lesser cost. At the higher level of prices prevailing throughout the greater part of the year, proceeds of this harvest exceeded the previous year's by over £280,000. Year end current assets of the group totalled just on £970,000 (£853,000) including £590,000 (£545,000) securities and cash against liabilities including £32,000 (£33,000) replanting provision, of £604,000 (£451,000).

J. E. Nathan, head of RUBBER ESTATES OF MALAYA, however, finds some difficulty in assessing the outlook at the present time. On the optimistic side he sets the rapid annual increase in world requirements of new rubber, both natural and synthetic, the fact that eastern suppliers will not show any material increase for the next three years and the possibility that exports from Indonesia, until recently the largest producing area, may be disrupted by political and economic troubles.

On the reverse side of the medal are the potential expansion in synthetic production, mainly in the consuming countries outside the United States, the continued improvement in the quality of these products and uncertainty regarding stockpile sales. The company has decided to sell for £341,250 part of its estate and under pressure from a group of shareholders in Singapore may take further advantage of the 'exceptional prices' now being paid at present for rubber estates in the Federation of Malaya.

Mr Nathan puts forward the interesting proposition that, apart from the prevailing view that the industry has favourable trading prospects, these high prices are due partly to the nervousness of some wealthy Singapore Chinese concerning the future policy of the Singapore Government.

One of the most interesting takeover buzzes has concerned MERLIMAU PEGOH, who have been linked with the giant DUNLOP rubber concern. Although there is no official support for this rumour Merlimau has been a favourite in the takeover stakes for the past couple of years. The view apparently is that with its direct ownership of several estates comprising over 20,000 acres of rubber and control of four other concerns owning almost another 7,000 acres, the company is a prize well worth gaining by one of the syndicates now operating in this field. Even now, with the 2s. shares at a new high of almost 5s., the market valuation of the rubber areas is only around £80 per acre, without allowing for liquid assets. In fact, on the trading side, there can be little doubt that last year's dividend payout of 17½% will be improved upon, it has been officially estimated.

While consumption of new rubber during January in the United States recorded a satisfactory advance as compared with the corresponding period of last year, the natural rubber quota slipped from 49,900 to 46,800 tons or 35.7% of the total to 32.8%. During the period under review there was little or no change in the cost of general purposes synthetic. Natural rubber, on the other hand, bounded by over 10d. per lb., and there can be little doubt that the price factor has had a good deal to do with the significant changes shown in these figures. Long-term dangers arising from present excessively high levels for natural rubber have been frequently stressed in recent months. The fears expressed by leading authorities in the plantation world now, it appears, are materializing. Although the possible reaction to the general position of the present unduly large premium for natural rubber should not be underrated, the experts consider there is no occasion for any real alarm.

Excellent results were returned by ELPITIYA RUBBER ESTATES. The net figure has risen from £1,341 to £16,189 and the dividend has been stepped up 22% to 30%. At the last two annual meetings a group has sought to replace the board of directors. Directors say now they 'greatly appreciate' the confidence in them and ask for proxy support. The company's meeting is to be held on March 25.

SELANGOR RIVER RUBBER ESTATES declared a final dividend of 17½% making 30% for 1959. This compares with the previous 20% total. Net profit came out at £58,298 compared with £35,488.

Mr W. J. C. Richards, chairman of SITTANG VALLEY RUBBER ESTATE, said at the company's meeting last week that unless the company replanted it would in time die a natural death. But if that did happen they would still have considerable money to distribute to stockholders. The estate, he said, was showing remarkable vitality and they were not losing very much by marking time in anticipation that investment in rubber in Burma would become more attractive. If, in the end, conditions were made as favourable in Burma as they were in Malaya, the company had the money with which to replant or extend. Mr Richards said the company was one of the cheapest producers of rubber and the results were 'pretty good.'

Swinburne Award

The Council of the Plastics Institute announce that the Swinburne Award, instituted in 1959 and consisting of a Gold Medal, a certificate and a sum of money, will now be an international one.

It will be made to anyone, whether he is a member of the Institute or not, and wherever he lives, who makes an outstanding contribution to the science or technology of plastics or of plastics engineering, or any science or technology in any field relating to plastics or plastics engineering.

PI Midlands Visit

The first Plastics Institute visit will be held from May 20-22. The Midlands section, the second largest, is to be visited and a full programme includes a choice of visits to a number of firms (including Bakelite, Dunlop, I.C.I. Metals Division, Cadburys and Fisher and Ludlow), a civic reception in the Council House, Birmingham, and an evening at the Stratford Memorial Theatre.

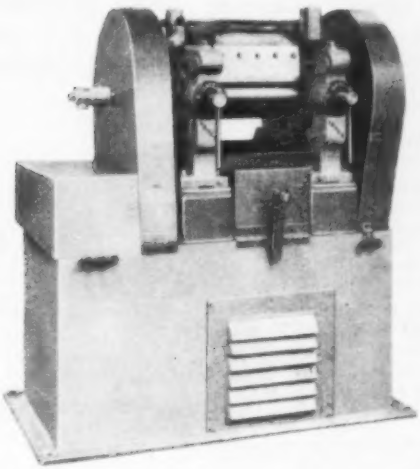
Application forms to take part in the visit can be obtained from the institute. If the visit is a success, the institute hopes that further meetings will be arranged every two years with other sections.

Neumàticos Goodyear S.A., Argentina, recently announced the arrival of a 60-ton Banbury mixer for one of the new buildings now being erected at Hurlingham as part of its programme for expanding output.

Latex Engineering Co

The illustration on the left represents: Steam-heated 2-daylight 12½/25 Ton Press

On the right:— Double Geared Motor Driven 2-speed Laboratory Mill.



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Rubber Markets

LONDON

Quiet conditions persisted in the London rubber market throughout the week but the undertone of the market has been very satisfactory and prices have been well maintained in most cases.

Latest prices are as follows:

No. 1 RSS Spot: 33½d.-34¼d.

Settlement House:

April 34d.-34¼d.

April/June 34d.-34¼d.

July/September 33d.-33¾d.

October/December 32⅝d.-32¾d.

January/March 31¾d.-32d.

No. 1 RSS cif basis ports:

March 34¼d.-34½d.

April 34¼d.-34½d.

Godown:

April 118¼ Straits cents nominal.

LATEX

Centrifuged latex per gallon in drums, April, seller, 20s. 4d., cif European ports, Spot, 20s. 7d. Bulk, 19s. 8d. value. Creamed, seller, April, 19s. 10d. Normal, seller, April, 15s. 7d.

NEW YORK

The New York rubber market ruled as under on March 14:

DEALERS' PRICES

	US cents per lb., ex-dock	
	Today	Previous
No. 1 RSS, March	40¼n	40¼n
April	40¼n	40¼n
No. 2 RSS, March	40¼n	40¼n
April	40¼n	40n
No. 3 RSS, March	40¼n	40¼n
April	40¼n	40n
No. 1 RSS, Spot	40¼n	40¼n
No. 3 amber blanket, crepe, May	39¼n	39¼n
No. 1 latex thin crepe, March	45¼n	45¼n
No. 1 latex thick crepe, March	43¼n	43¼n

FUTURES—REX CONTRACT

	March 14	Prev. Close
March	40.75b–41.05a	40.75b–40.85a
May	40.00t	39.75t
July	39.05–39.10t	38.90b–39.05a
September	38.60t	38.30b–38.50a
November	38.10b–38.30a	37.85b–38.15a
January	37.50b–37.75a	37.20b–37.45a
March	36.90b–37.15a	36.60b–36.90a

Sales: 48 Tendency: Very steady, dull.

Rubber futures were steady on March 14 in light featureless dealings. Physical rubber was quiet but steady. Factory interest was so far slight. Futures were very steady later in the day on light covering and new buying.

SINGAPORE

The market was idle on March 14 and little business was done. Off-grades and lower sheets were neglected. Factories were quiet. The afternoon was quiet throughout. Prices remained steady. After-hours, the market was quietly steady.

	Malayan cents per lb., fob Malayan ports to open ports	
	March 14	Previous Close
No. 1 RSS, April	118½–119	118½–119¼
May	118¼–118½	118¼–118½
No. 2 RSS, April	117 –117¼	117 –117¼
No. 3 RSS, April	115¼–116¼	115¾–116¼
No. 4 RSS, April	114¾–115	114¾–115¼
No. 5 RSS, April	111¼–112¼	111¼–112¼
No. 1 Spot	119¼–119½	119¼–119½
No. 3 blanket, thick re-milled, April	112¼–114¼	113 –115
No. 1 fine pale crepe, April	132 –134	133 –135
2X thin brown crepe, April	112½–113	113 –114

Tendency: Quiet.

The Industries Syndicate quote latex, native produce, 60%, centrifugal, packed in rectangular drums fob at 210.00d. per gallon.

CEYLON

No. 1 RSS

The price of No. 1 RSS spot at Colombo on March 14 was 137½ (137½) Ceylon cents per lb.

AMSTERDAM

The Amsterdam rubber market ruled as follows on March 14:

No. 1 RMA:	Guilders per kilo March 14	Previous
March	3.37	3.37
April	3.35	3.35
May	3.35	3.35
June	3.35	3.35
April/June	3.35	3.35
July	3.22½	3.22½

Sales: 45 Tendency: Quiet

DJAKARTA

Some transactions of sheet No. 1 at 40 rupiahs per kilo were reported on March 14. Buyers showed very little interest, following overseas advices. The market closed very quiet.

	(Rupiahs per kilo) Today	Previous
Spot No. 1 Priok	39.25b	39.25b
Spot No. 2 Priok	38.25b	38.25b
Spot No. 3 Priok	37.25b	37.25b
No. 1 fine pale crepe, spot	38.00b	38.00b

Tendency: Very quiet.

BANGKOK

No. 1 RSS

The price of No. 1 RSS at Bangkok on March 14 was 37.25 (37.50) US cents per lb.

New 'Epikote' Resin

Shell Chemical Company Ltd. announce the addition of a new solid casting resin 'Epikote' 1040 to their range of epoxy resins. It is intended for use with a new curing agent 'Epikure' EPA and has been developed specially for the production of large castings and for the encapsulation and potting of large electrical components. The cured resin is said to have excellent chemical, electrical and thermal shock resistant properties.

Durable Change

Durable Plastics Ltd., By-Pass, Guildford, will change its name on April 1 to Plastic Coatings Ltd.

New Coating Resins

At the OCCA Exhibition (March 15-17), BIP Chemicals Ltd. introduced two new coating resins, Beetle Alkyd Resin L.1858 and Beetle Urea/Epoxy Resin L.1853. Provisional data sheets are available.

Duncan Nowson has joined the polythene division of Union Carbide Ltd. as assistant to L. E. Whitmore, director of the division. Mr Nowson was previously with the Rank Organization, working on company development in the industrial field.

A laminate of galvanized steel sheet and coloured PVC for deck roofs is now being marketed by Ruberoid under the brand name 'DecoRdeck.'

IRI

SOUTH WALES SECTION

THE third annual dinner and dance of the South Wales and Monmouthshire Section of the Institution of the Rubber Industry was held at the Park Hotel, Cardiff, on Friday January 29. One hundred and two members, guests and friends were received by the section chairman, Mr W. Saul and Mrs Saul.

After welcoming the principal guests, Mr L. M. Read, representing the local section of the Plastics Institute, and Mrs Read, and Mr A. H. Henson, representing the Welsh College of Advanced Technology, and Mrs Henson, Mr Saul went on to say that though the section was a small and young one, it was nevertheless very vigorous and anxious to make its voice heard beyond its geographical confines. We were, he continued, proud to be members of an industry using one of the oldest polymers, and even more proud to be able to help the IRI make sure that rubbers remained among industry's most up-to-date materials.

Mr Saul said he hoped that the many friends of the Institution whom he was pleased to see present would find a way to joining it in due course, and he was very happy to note that many more friends than they had had before were with them.

The evening was specially devoted to the ladies of the 'rubber men' as compensation, because they could not normally share the excitement and pleasure which the men got out of working with rubber. Dancing followed dinner and continued with high spirits until a most enjoyable evening was brought to a close by the singing of 'Mae hen Wlad fy nhadau' and the National Anthem at 1 a.m.

Singapore Rubber Prices

From March 15 the Singapore Chamber of Commerce Rubber Association abandoned the fixing of official closing prices for RSS Numbers 2 to 5.

A spokesman for the Association said that the delay involved in fixing official closing prices for lower grades had been restricting dealings in these during the brief period each day when offices in Singapore and London are in telephone contact.

The Association began fixing official closing prices for sheet Numbers 2 to 5 on March 7. The Association will continue to fix official noon prices for Numbers 1 to 5 inclusive and closing prices for Number 1 (two shipment months) and spot. Firms dealing with London can thus revert to using the closing price for Number 1 as a basis and applying the noon differentials for lower grades.

JOSEPH ROBINSON & Co. Ltd.

SPRINGFIELD LANE IRONWORKS, SALFORD 3, LANCS.

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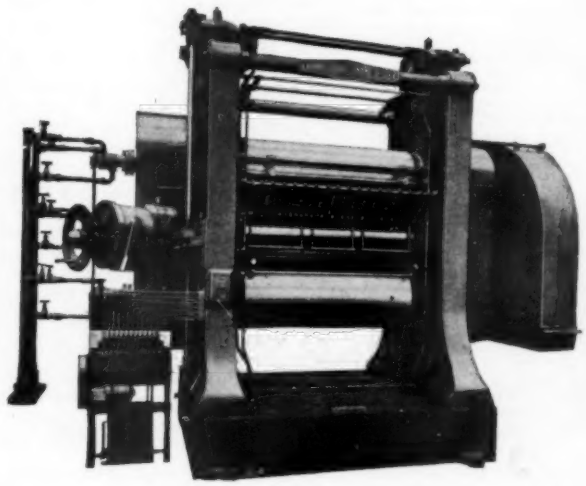

24" dia. x 68" face 3-ROLL EVEN and FRICTION SPEED RUBBER CALENDER, with Patent Nip Feed Guard, Circular Lubricating System from individually driven 12-point Forced Feed Lubricator with Self Filling Pumps. Mechanically Operated Elevating Unit for top and bottom Rolls. Variable Speed Drive to suit any requirement.

CONDUCTIVE RUBBER

ITS PRODUCTION, APPLICATION AND TEST METHODS

R. H. NORMAN, M.Sc., A.Inst.P., A.I.R.I.

Senior Physicist
Research Association of British Rubber Manufacturers

For the research worker and the technologist this book, which was recently serialized in *Rubber Journal*, will provide a comprehensive outline of the knowledge which exists on the "conductive" or "anti-static" classes of rubber. Among the contents the following subjects are most thoroughly examined: **Contact Resistance; Manufacture; Effect of Stress, Time and other Variables on Resistivity; Test Methods; Variability of Resistivity; Uses of Conductive Rubber.**

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RUBBER JOURNAL AND INTERNATIONAL PLASTICS

131 GREAT SUFFOLK STREET, LONDON, S.E.1

Industry INTELLIGENCE

Machines, Materials and Equipment

The Unimaster Dust Collector

A new dust collector, the Unimaster, is now available from Dallow Lambert and Co. Ltd., Thurmaston, Leicester. The collector has many improvements and is the successor to the firm's Dustmaster. It is a completely self-contained collector and is claimed to give greater filtration area per floor space required, and to have an improved fabric filter element of patent design, with a variety of fabric materials available to suit the dust being handled.

Almost every type of dust produced by a wide range of machines and processes can be effectively controlled. This flexibility is possible because the collector can be supplied with a variation of fans and motors, filters and dust containers. Applications requiring a large air volume but producing little dust can be dealt with just as effectively as those in which the air requirement is small and the dust load heavy. Light bulky dusts can be handled as easily as heavy concentrated dusts.

The new collector is initially available in the 70 series (70 sq. ft. of filter cloth area), fan capacity range 0 cfm at 6.2in. water gauge to 765 cfm at 3.3in. water gauge. A complete range of Unimaster collectors extending up to 250 sq. ft. of filter cloth area in a single unit dust collector will be available very shortly.

Rigid Safety Ladder

A novel form of ladder uses four tubular side rails, spaced by a series of mild steel webs to which the ladder rungs are attached.

This form of construction eliminates sag and spring, and provides the user with a pair of handrails. These factors should make for much greater safety for personnel unaccustomed to using ladders, and the provision of handrails enables users to ascend and descend with a fully upright posture and helps load-carrying.

The ladders can be built into scaffolding and are manufactured by John Inshaw Ltd., Easterhouse, near Glasgow.

Safety Feet First

Various devices have been introduced as fittings for ladders to prevent slipping. A new device from Vulcascot, 87 Abbey Road, N.W.8, eliminates any need for adjustment.

The foot of the ladder is secured through a joint swivelling in two planes to a square metal casting. The underside of the casting has bonded to it a non-slip ribbed pad of oil-resistant rubber which contacts the ground. The action of the universal joint ensures that the pad at the foot of each rail of the ladder independently and automatically adjusts itself to give a good area of firm contact with the ground.

An ingenious arrangement of cranked brackets ensures that one standard unit will bolt to uprights of 1in., 1½in., or 1¾in. thickness.

Hand Rubber Tester

The Bareiss-Exacta portable rubber tester measures Shore-hardness and complies with the conditions of the standardizations BS 903, A7, 1957, Part 20, ASTM D 676-58 T, and DIN 53505. This precision measuring device has a penetrating point of tempered steel. The scale is graduated from 0-100 Shore, and the instrument is accompanied by a comparison plate so that the user has a means of testing the penetrating point.

Bareiss-Exacta also produce a dragging indicator for rolls, hoses and similar articles. Dimensions of the portable tester illustrated are 70 x 58 x 22mm., and the UK agents are Industrial Services, 140 High Street, Waltham Cross, Herts.

Technical Data

Breakdown of Butyl Rubber with a Peptizer

A study of the effect of using DiCup 40C as a peptizer on the physical properties of Polysar Butyl 402 compounds loaded with silica or carbon black is described in Polysar Technical Report No. 8:9A, by Z. J. Dorko, distributed in the UK by Polymer (UK) Ltd., Walbrook House, Walbrook, London, E.C.4.

The silica compound contained 50 phr of HiSil 233, and DiCup 40C was compared with two other peptizers in this compound. Three carbon black compounds were used, containing 50 parts of SAF black, 50 parts of FEF black and 90 parts of SRF black phr, respectively. Two methods of mixing were used with the silica compound. In the first method, the Polysar Butyl 402 was broken down with the peptizer and then the other ingredients were incorporated. In the second method, the silica was added followed by the peptizer and then the other ingredients. Data are given for the compound viscosity, scorch time and extrusion properties of the stocks and the physical properties, before and after ageing, of the vulcanizates.

Aqueous Adhesive for Bonding Elastomers to Synthetic Fabrics

A composition based on neoprene latex and an isocyanate is a suitable adhesive for bonding neoprene or SBR to nylon or Dacron fabrics. Information on adhesives of this kind is given in Du Pont Elastomer Chemicals Department Report BL-361, by C. H. Gelbert, available in the UK from the Du Pont Co. (UK) Ltd., 76 Jermyn Street, London, S.W.1.

The isocyanate is Hylene MP. This is a diisocyanate which has been reacted with phenol to block or inactivate the isocyanate groups, but it becomes reactive on heating. Neoprene latices Types 635 and 673 have been found to be most effective for use with Hylene MP, maximum bond strength being obtained with Type 673. A formulation is given for an adhesive based on Hylene MP and neoprene latex Type 673, together with data for the bond strength achieved when the adhesive is used to bond neoprene to a nylon fabric.

New Publications

Newest New Town

A brochure comes from the Cumbernauld Development Corporation outlining the advantages an industrialist may find in this new town in the heart of Scotland's industrial belt. Cumbernauld is the newest of the new towns and is taking part of Glasgow's overspill; in order that it can become a self-contained community it needs its own industry. It has a target population of 50,000, and offers modern buildings, facilities for expansion, skilled labour and good communications—fourteen miles from Glasgow, it is also on the main North-South railway line.

There are excellent sites available, for both small units employing a few workers, and large ones employing thousands. There are extensive chemical and oil refining plants at Grangemouth 13 miles away, and Glasgow, of course, has a wide range of service industries and supplies of raw materials. The brochure can be obtained from: Cumbernauld Development Corp., Cumbernauld, By Glasgow.

Porvic Separators

Pritchett and Gold, who claim to be the oldest lead-acid battery company in Great Britain, issue a booklet on their Porvic battery separators. Porvic is a special form of microporous PVC, which contains no plasticizer, and the booklet deals with its special advantages as a separator; the porosity is 85%, it is a perfect insulator, and resistant to acid attack.

One section deals with history and manufacture, and there is also a number of tables of technical data.

RUSSIAN PATENTS

An English translation of the Russian Journal 'USSR Patents and Inventions' is now being published by Pergamon Press Ltd.

The English translation, which contains abstracts, is published monthly, each issue containing the abstracts from two Russian issues, the Russian Journal being published 24 times a year. There are 17 separate sections ranging from chemistry and chemical engineering through electronics, mining, building industry, light and precision engineering to aeronautics. In the first section, chemistry and chemical engineering, under class 39 are contained 'horn, ivory and other materials for carving, rubber, gutta percha and other plastic substances, shatterproof glass using plastics, and the production of resins, particularly condensation and polymerization products.'

The annual subscription to the English translation costs £50 ($150). Subscriptions to specialized sections can be taken out, that for chemistry and chemical engineering being £15 ($40). Readers can obtain from the Pergamon Press copies of the complete Russian patent specifications in the original or an authoritative translation in English and photostat copies.

Future Events

INSTITUTION OF THE RUBBER INDUSTRY

London Section. — Tuesday, March 22 at the Criterion, Piccadilly, W.1, at 6.30 p.m. 'Starting a Hypothetical Rubber Factory' by G. F. Kelly.

Western Section. — Wednesday March 23 at the Royal York Hotel, Bath, at 7.45 p.m. A joint meeting with the Plastics Institute. 'An Account of the Manufacture of General Purpose Styrene-Butadiene Rubbers' by R. Jackson (International Synthetic Rubber Co. Ltd.).

Manchester Section. — Monday March 28 at the Engineer's Club, Manchester, at 6.45 p.m. 'Future of Polymers,' by Dr L. C. Bateman (BRPRA), Dr W. C. Davey (Dunlop), and Dr W. F. Watson (RABRM).

PLASTICS INSTITUTE

Midlands Section.—Friday March 25 at the Chadwick Manor Hotel, Knowle. Dinner-dance.

Western Section. — Wednesday March 23. Joint meeting with the IRI Western Section: see above for details.

Yorkshire Section.—Friday March 25 at Powolny's Restaurant, Leeds. Annual dinner-dance.

Field Marshal Sir William Slim has been appointed as an additional director of I.C.I. He will act as a non-executive director.

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

WEYLEX and WEYLON (788,728 and 788,730) Synthetic resins for use in manufacture. Michael George Hope and Frederick George Lambert, trading as M. G. Hope and Partners, 57 Hereford Road, Feltham, Middlesex. (Class 1; February 2 1960).

SHIP (791,073) Carbon black for industrial purposes. Ship Carbon Co. (GB) Ltd., Paycocke Road, Basildon, Essex; and Chadwell Works, Grove Road, Chadwell Heath, Essex. (Class 1; February 2 1960).

FOSTACRYL (B789,122) Acrylic resins for use in manufacture. Foster Grant Co. Inc. (a Corporation organised and existing under the laws of the State of Delaware, United States of America), 289 North Main Street, Leominster, State of Massachusetts, United States of America; Manufacturers and Merchants.—2nd April 1959. Address for service is c/o Haseltine Lake and Co., 28 Southampton Buildings, Chancery Lane, London, W.C.2. To be Associated with No. 789,121 (4240, 1268) and another.

DURASCALE (796,416) Films of plastics coated with chemicals, for photo-copying and the like purposes. Hall Harding Ltd., Stourton House, Dacre Street, London, S.W.1; Manufacturers and Merchants.—9th October 1959.

Bry

(793,110) Machine couplings and belting included in Class 7, none being made of metal. (793,113) Pneumatic tyres and inner tubes therefor; and solid tyres, not made of metal. British Nylon Spinners Ltd., Pontypool, Monmouthshire. (Classes 7 and 12; February 2 1960).

RAVINOL (791,132) Plastics in the form of sheets, blocks, rods, pipes, tubes or shaped pieces, and articles made therefrom, all being goods included in Class 17. Anic S.P.A., S. Donato Milanese, Milan, Italy. Address for service is c/o D. Young and Co., 9 Staple Inn, London, W.C.1. (Class 17; February 2 1960).

SARABAND (796,699) Cushions (upholstery), mattresses, pillows (not for surgical or curative purposes), and upholstered parts of furniture. Dunlop Rubber Co. Ltd., Fort Dunlop, Erdington, Birmingham 24. (Class 20; February 2 1960).

GIRFLEX (795,379) Yarns and threads, all of synthetic or natural textile materials. Greengate and Irwell Rubber Co. Ltd., Greengate Works, Greengate, City of Salford; and Irwell Works, Ordsall Lane, City of Salford. (Class 23; February 2 1960)

WAFOLITE (795,408) Soles, heels, sole and heel tips and sole and heel protectors, all for footwear. Sussex Rubber Co. Ltd., School Road, Willesden, London, N.W.10. (Class 25; February 2 1960).

LEACRIL (793,422) Polyacrylonitrilic resins and copolymers of acrylonitrile, all being synthetic resins for use in industry. A.C.S.A.-Applicazioni Chimiche S.p.A., Corso Europa 20, Milan, Italy. Address for service is c/o A. A. Thornton and Co., Northumberland House, 303-306 High Holborn, London, W.C.1. (Class 1; February 9 1960).

TUBIFOAM (791,417) Medical and surgical bandages, and materials prepared for use in bandaging, all made wholly or principally of foamed rubber or of foamed plastics. Seton Products Ltd., Tubiton House, Medlock Street, Oldham, Lancashire. (Class 5; February 9 1960).

'PERSPEX'

(795,032) Refracting material for, and refracting parts of, optical apparatus and appliances; advertisement signs and advertisement apparatus, all included in Class 9. Imperial Chemical Industries Ltd., Imperial Chemical House, Millbank, London, S.W.1. (Class 9; February 9 1960).

WAYMASTER (785,154) Tyres and inner tubes therefor. The Avon India Rubber Co. Ltd., "Avon" India Rubber Works, Melksham, Wiltshire. (Class 12; February 9 1960).

LI-LEX (787,931) All goods included in Class 28 made of plastics; (787,924) all goods included in Class 18 made of plastics. P. B. Cow (Slough) Ltd., 470 Streatham High Road, London, S.W.16.

STABILEX (759,904) Tyres and inner tubes therefor, all for vehicle wheels. Dunlop Rubber Co. Ltd., Fort Dunlop, Erdington, Birmingham, 24. (Class 12; February 9 1960).

BARPAK (B788,856) Paper included in Class 16; and packaging materials made of plastics. Barrett Packaging Ltd., Alma Park, Grantham, Lincolnshire. (Class 16; February 9 1960).

POLYGLASS (791,365) Materials in the form of sheets made of plastics reinforced with glass fibres, the plastics predominating, being goods for use in the manufacture of travelling cases, travelling bags and handbags. W. Wood and Son Ltd., Kelvin Works, Power Road, Chiswick, London, W.4. (Class 17; February 9 1960).

STYLAR (792,197) Plastics in the form of sheets, panels, plates, rods, films, tubes, blocks, strips and shaped sections, all included in Class 17. Plastic Engineers Ltd., Treforest Industrial Estate, Pontypridd, Glamorganshire. (Class 17; February 9; 1960).

NOVAMASTIK (B794,352) Compounds made of synthetic resin plastics for hermetically sealing. Nova Productions Ltd., 22 Addison Street, Nottingham. (Class 17; February 19 1960).

SIDAC (794,610) Regenerated cellulose (non-textile) in the form of blocks, rods, tubes, sheets, strips, reels and shaped sections. British Sidac Ltd., Vintry House, Queen Street Place, London, E.C.4. (Class 17; February 9 1960).

PLANSEL (789,089) Ornaments, decorations and trays, all included in Class 20, domestic clothes-airers (not being parts of installations and not containing heating elements), all of plastics; furniture, furniture feet; boxes and cases, all included in Class 20; and sink plugs of plastics. Creators Ltd., Plansel Works, Albert Drive, Sheerwater, Woking, Surrey. (Class 20; February 9 1960).

SETRA (791,748) Curtain rails and holders for use therewith, all of plastics. Scrubb and Co. Ltd., Wimbledon Factory Estate, Morden Road, Wimbledon, London, S.W.19. (Class 20; February 9 1960).

KLEINERT'S DRI-KLEEN

(792,810) Garment shields capable of being dry cleaned. I. B. Kleinert Rubber Co., 485 Fifth Avenue, New York, and 91 New Bond Street, London, W.1. (Class 25; February 9 1960).

ETHAFOAM (794,715) Mattresses, pillows (not for surgical or curative purposes), cushions (upholstery), bolsters and upholstered parts of furniture, all made of foamed materials. Latex Lancashire (Wholesale) Ltd., 25 Market Street, Huddersfield, Yorkshire. (Class 20; February 9 1960).

Solution to RJIP Crossword

(See page 442 this issue)

ACROSS: 2, Plasticity. 7, Ale. 8, Analyses. 10, Urban. 11, Letters. 12, Chef. 15, Love. 17, Obviate. 18, Emend. 19, Compound. 21, Tar. 22, Impregnate.

DOWN: 1, Caoutchouc. 2, Pebble. 3, Alan. 4, Teaset. 5, Crystal. 6, Toe. 9, Suspenders. 13, Flipper. 14, Strung. 16, Odette. 18, Edna. 20, Ohm.

PATENT LIST

Printed copies of the Specifications in the following list, published by permission of the Controller of H.M. Stationery Office, can be obtained from the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d., including postage, but about six weeks after the date of this publication will usually elapse before they come available. Orders with remittance may be sent in advance to the Patent Office, and will be fulfilled immediately the Specifications are published.

COMPLETE SPECIFICATIONS ACCEPTED

Open to public inspection on March 2 1960

K. Ziegler. Production of high molecular weight polythenes, and compositions suitable for use as catalysts therein. 829,627.

Montecatini Soc. Generale per L'Industria Mineraria e Chimica. Preparation of high molecular weight materials. 829,559.

British Celanese Ltd. Film-dispensing apparatus. 829,563.

Lord Manufacturing Co. Bonding rubber to polyurethane. 829,564.

Rubber Improvement Ltd., and J. Lewes. Footwear. 829,318.

Radio Corporation of America. Ferroelectric systems. 829,566.

Ciba Ltd. Glutarimides and process for their manufacture. 829,415.

Shell Research Ltd. Purification of secondary butyl alcohol. 829,424.

British Cellophane Ltd. Heat shrinkable protective coverings and processes for applying protective coverings to articles to be packaged. 829,309.

Imperial Chemical Industries Ltd. and W. Stanley. Crimping artificial filaments, yarns and fibres. 829,693.

J. P. Bemberg A.G. Apparatus for the production of artificial yarns with fluctuations in denier. 829,361.

Hercules Powder Co. Low temperature emulsion polymerization of unsaturated compounds. 829,213.

Lamson Paragon Ltd. Bags or envelopes made of heat sealable plastic material. 829,215.

Imperial Chemical Industries Ltd. Polymerization catalysts. 829,440.

British Nylon Spinners Ltd. Twisting of continuous filament yarns. 829,585.

British Insulated Callender's Cables Ltd. Reeling devices. 829,328.

Goodyear Tire and Rubber Co. Automatic adjustment mechanism for disc brakes. 829,221.

Unilever Ltd. Method and apparatus for dividing plastic substances by volume. 829,591.

Esso Research and Engineering Co. Curing rubbery copolymers. 829,598.

E. I. Du Pont De Nemours Co. Perfluorocarbon polymers and polymer compositions and processes for preparing same. 829,600.

E. I. Du Pont de Nemours Co. Polymerization of methacrolein. 829,601.

Goodyear Tire and Rubber Co. Means for automatically adjusting brake pressure. 829,720.

Montecatini Soc. Generale per L'Industria Mineraria e Chimica. Hollow articles produced from thermoplastic materials. 829,469.

E. I. Du Pont de Nemours and Co. Polytetrafluorethylene fine powder. 829,503.

Dow Chemical Co. Method for cross-linking vinyl chloride polymers. 829,512.

Esso Research and Engineering Co. Curing rubber copolymers. 829,515.

E. I. Du Pont de Nemours and Co. Book cover material. 829,674.

Houdry Process Corp. Preparation of isoprene. 829,611.

Upjohn Co. Amides and the preparation thereof. 829,270.

Pneumatiques and Caoutchouc Manufacture Kleber-Colombes. Vulcanizing presses. 829,271.

Bataafsche Petroleum Maatschappij N.V., De. Process for the production of ethylene oxide. 829,613.

Farbenfabriken Bayer A.G. Dithiacyclopentene derivatives. 829,529.

Open to public inspection on March 16, 1960

Distillers Co. Ltd. Polymerization process. 830,742.

Manufactures des Glaces et Produits Chimiques de Saint-Gobain, Chauny and Cirey S.A. Des. Methods of polymerization using gamma radiation. 830,515.

Dayton Rubber Co. Combination wash-up, colour-separating and ink-flow control means for use in connection with printing presses. 830,334.

Rottweiler Kunstseidefabrik A.G. Manufacture of terephthalic acid glycol esters suitable for polycondensation. 830,691.

E. I. Du Pont De Nemours and Co. Process for extruding a synthetic fibre-forming liquid and a spinneret assembly for use in the process. 830,441.

NEW COMPANIES

P.A.M. (Plastics and Metals) Ltd. (651,118).—March 2. Capital: £500 in £1 shares. To carry on the business of manufacturers, converters and processors of and dealers in plastic materials of all kinds, manufacturers of and dealers in plastic and neon signs, display accessories, advertising and publicity goods, etc. The directors are: Willie Matthews, 50 Crawshaw Grove, Sheffield, 8; Dora Wells, 15 Becket Avenue, Sheffield, 8. Regd. office: 512 London Road, Sheffield, 2.

Tyreshops Ltd. (651,136).—March 2. Capital: £100 in £1 shares. To carry on the business of dealers in tyres, etc. The first directors are to be appointed by the subscribers. Regd. office: 63/65 Piccadilly, W.1.

E. Whitney Ltd. (651,150).—March 2. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in rubber, balata, gutta percha, vulcanite, ebonite and similar substances and goods, etc. The directors are: Elsie S. E. Whitney and Harry Whitney, both of 100 Exeter Road, Edmonton, N.9. Regd. office: Barclays Bank Chambers, The Broadway, N.9.

Aldridge Fibrecraft Ltd. (650,873).—February 29. Capital: £10,000 in £1 shares. To carry on the business of manufacturers of and dealers in plastics and fibre-glass products, and of motor engineering tools, boats and boating equipment and accessories, etc. Michael J. Webb is the first director. Regd. office: Leighswood Grove, Leighswood Avenue, Aldridge, Staffs.

Ever Ready Plastics Co., Ltd. (650,923).—February 29. Capital: £8,000 in 1,000 12½% redeemable preference and 7,000 ordinary shares of £1. To carry on the business of manufacturers, importers and exporters of and wholesalers and retailers of plastic mouldings and plastic goods, etc. The directors are: Leslie W. R. Dunmore, 66 Marlands Road, Ilford, Essex; Leonard Hatch, 54 Winchester Avenue, Granham, Upminster, Essex. Regd. office: 97/9 Hainault Road, Romford, Essex.

Modern Tyre Services (Southampton) Ltd. (650,838).—February 29. Capital: £1,000 in £1 shares. The first directors are to be appointed by the subscribers. Regd. office: 91 Crane Street, Salisbury.

COUNTY COURT JUDGMENTS

NOTE.—*These Judgments which are supplied from the Registry of County Court Judgments, Lord Chancellor's Department, 3 Dean's Yard, London, S.W.1, are not necessarily for debt, and some may have since been satisfied. They may be for damages or otherwise, they may relate to actions bona fide contested between the parties, or they may be against defendants liable in a representative capacity and not personally; but no distinction is made on the register. A judgment does not imply inability to pay. Judgments are not returned to the Registry if satisfied in Court Books within twenty-one days.*

SHEERLINE PRODUCTS (PLASTICS) LTD., Pears Road, Hounslow, Middlesex, Brentford, £318, January 4 1960.

R. A. MARTIN, 113 Derby Road, Southampton, Hants, Westminster, £13, December 30 1959.

GEOFFREY MORRIS, 91 Surbiton Road, Kingston-on-Thames, Surrey, plastic manufacturer, Westminster, £73, December 29 1959.

TYNE PLASTICS COMPANY, 24 Argyle Street, Newcastle upon Tyne, Northumberland, Oldham, £16, December 31 1959.

R. COXON, 75 Prenton Place, Chester, Cheshire, tyre dealer, Wrexham, £12, January 15 1960.

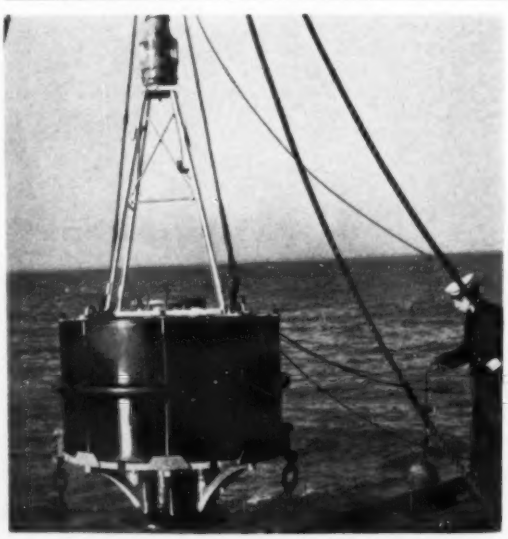
MACRON PLASTIC MOULDS AND INDUSTRIAL TOOLING, 48 Windsor Street, Chertsey, Surrey, Colchester and Clacton, £46, September 15 1959.

Increases of Capital

Wembley Tyres Ltd. (650,716).—February 26. Capital: £500 in £1 shares. The directors are: George F. Baxter and Mrs. Victoria J. Baxter, both of 33 Blackbird Hill, N.W.9. Regd. office: 33 Blackbird Hill, N.W.9.

J. Gorman Tyres Ltd. (650,755).—February 26. Capital £5,000 in £1 shares. The directors are: Joseph Gorman, Mrs. Mary Gorman and Peter Gorman, all of 28 St. Anthony Road, Heath, Cardiff. Regd. office: 6 Barracks Lane, Cardiff.

Creation of four new sales posts by Romac Industries Ltd., London, is announced. Four new area managers, who will work under the field sales manager and the divisional manager, are: Mr Peter Blake (South-West Area), Mr Jack Milner (The Midlands), Mr Fred Hepworth (North-East Area), Mr Len Staal (North-West Area).



This experimental reinforced plastics buoy which was placed in the North Sea off Harwich (*RJIP February* 13) **weighs only two tons, compared with the six tons of conventional steel buoys. Six acetylene cylinders contain enough gas to keep the lantern flashing for a year without attention**

R·J·I·P·

CLASSIFIED ADVERTISEMENTS

Classified Advertisements may be displayed under each heading at £3 per inch, single column. Write or phone for details

APPOINTMENTS VACANT

6d. a word, Minimum 10/-. Box 2/-.

ADHESIVE chemist required for research and development. Previous experience essential including knowledge of synthetic rubber and latices. Rapidly expanding firm, excellent prospects.—Apply in writing to Managing Director, Crispin Chemical Co. Ltd., Coleman Road, Leicester. (129)

ASSISTANT to Managing Director in Midland factory producing on mass production lines dipped latex goods and injection moulded parts. Applicants must have a sound technical knowledge of this type of trade; also a flair for management. This position holds prospects for the future with an old-established company. Give fullest details of age, training and positions held. Also salary expected.—Box 135. (135)

CHIEF chemist required to take complete charge of works laboratory in medium-sized rubber factory in Manchester area. A.I.R.I. or L.I.R.I. standard desirable, this is a position with excellent prospects and qualifies for pension scheme. Salary will be in accordance with the responsibility that the post carries.—Write stating age, qualifications and experience to Box 137. (137)

FERODO LIMITED, Chapel-en-le-Frith, via Stockport, have a vacancy for a fully experienced rubber mill-room foreman. Applicants, aged 30-40, must be experienced in modern mill-room techniques with drug stores, pressure and open type mixers, disintegrators, 2 and 3-bowl mills, etc., used to line production on planning procedures and able to organise production on a 24 hour basis and control production staff. This is a senior staff appointment with a progressive salary and scope for advancement. The company operates a contributory pension scheme.—Applications giving full details of age, experience, qualifications and present salary, should be sent to the Personnel Manager. (148)

LABORATORY assistant, aged 19/20 years, for process control and development work. Experience in rubber technology preferable. Please reply in writing stating experience, qualifications to:—Technical Manager, The Guide Bridge Rubber Co. Ltd., Bury, Lancs. (143)

MANAGER for moulding department in Hertfordshire. Experienced and used to full responsibility for labour control and maximum production. Excellent prospects for keen energetic applicant.—Apply Box 120. (120)

RUBBER technologist, minimum standard L.I.R.I., but with at least three years' experience in the rubber industry, required by medium-sized company specializing in the use of rubber in engineering. Candidate should have worked for some time with a development team. The successful applicant will be expected to continue with his studies with a view to taking the A.I.R.I. examination. Salary £600-£650 per annum.—Write Box D.697, c/o Streets, 110 Old Broad Street, E.C.2. (141)

RUBBER technologist, A.I.R.I. or equivalent, required by medium-sized rubber company specializing in the use of rubber in engineering. Candidate should have had experience in compounding natural and synthetic rubbers and be capable of working, to a large extent, on his own initiative. This is an excellent opportunity for a young man to broaden his experience. The successful candidate will have to tackle a wide variety of problems and will thus gain experience in nearly every branch of rubber technology. Salary envisaged is in the region of £700-£850 per annum, but will depend on experience.—Write Box D.696, c/o Streets, 110 Old Broad Street, E.C.2. (140)

SENIOR laboratory assistant required by manufacturing company near London. A knowledge of the formulation and manufacture of adhesives based on synthetic resins and polymers essential. Salary according to age and experience.—Reply to Box 142. (142)

RUBBER technologist or chemist required as assistant to Chief Chemist for supervision of laboratory. A practical approach, a knowledge of synthetics and their control and an ability to work with a minimum of supervision are necessary.—Apply Chief Chemist, B.A.L. and Thomas Boorne and Co. Ltd., Oakeywell Street, Dudley, Worcs. (121)

TECHNICAL COURSES

MANCHESTER EDUCATION COMMITTEE

NEWTON HEATH TECHNICAL COLLEGE

HAGUE STREET, MANCHESTER, 10.

SHORT RESIDENTIAL COURSE IN PRACTICAL RUBBER TECHNOLOGY

Tuesday, 5th—Thursday, 14th April, inclusive.

The course is essentially practical in nature, but a number of optional short lectures will be given. Instruction will be provided in the handing of natural and synthetic rubbers, including mastication, mixing, calendering, extruding, spreading, moulding and vulcanization. Practice in latex compounding and fabrication will be available if required.

Further details may be obtained from the Head of the Applied Science Department. (144)

ARTICLES FOR SALE (SECONDHAND)

6d. a word, Minimum 12/6 Box 2/-

BANBURY No. 11, jacketed with 250 h.p. drive. Bridge 84in. x 26in. mill with 150 h.p. drive. Intermix K4 with 110 h.p. drive. 60in. x 22in. Single-geared mill with 125 h.p. drive. Two Carter high-speed braiding machines. Available ex stock.—Reed Brothers (Engineering) Ltd., Replant Works, Woolwich Industrial Estate, London, S.E.18. Tel.: Woolwich 7611/6. (146)

LABORATORY steam boiler, 4ft. 6in. x 1ft. 6in., gas heated with burner, W.P. 70lb. Also Autoclave 15in. diameter x 21in. long, W.P. 60lb. May be seen in London.—Box 147. (147)

TWO-INCH plastics extruder with accessories for wire covering.—Box 136. (136)

600

COMPRESSOR SETS

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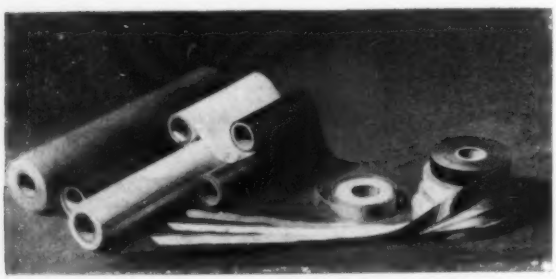

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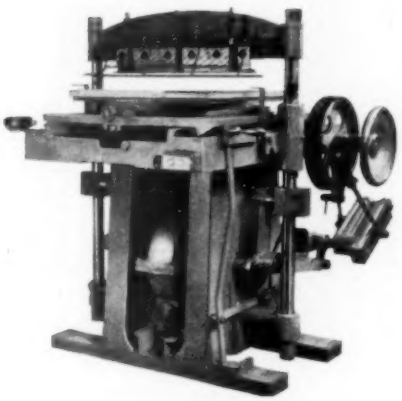

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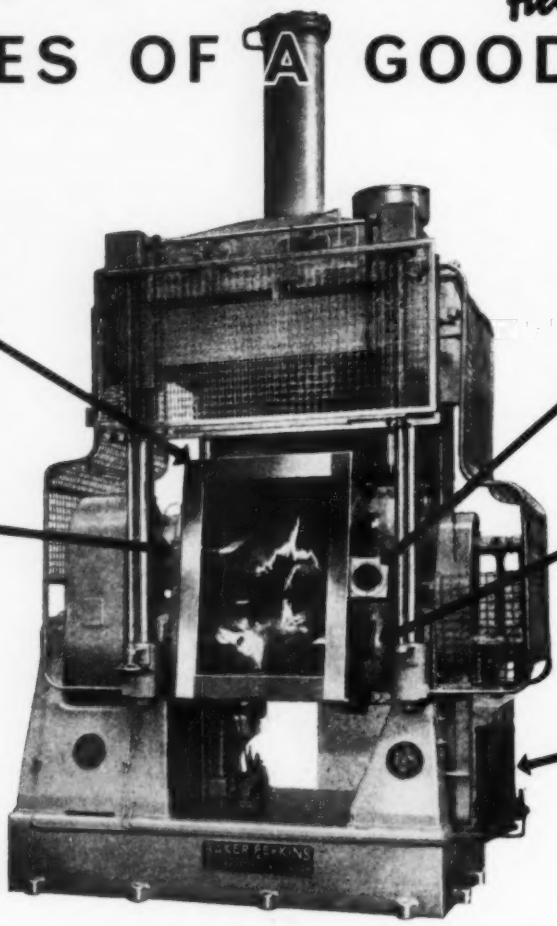
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